RESEARCH NOTE 80-19

EXPERIMENTAL EVALUATION OF CONCEPTS FOR MIQSTURE: AN ONLINE INTERACTIVE LANGUAGE FOR TACTICAL INTELLIGENCE PROCESSING

Robert V. Katter and Gregg Bell
Operating Systems, Inc.

HUMAN FACTORS TECHNICAL AREA

U. S. Army

Research Institute for the Behavioral and Social Sciences

December 1979

U. S. ARMY RESEARCH INSTITUTE FOR THE BEHAVIORAL AND SOCIAL SCIENCES

A Field Operating Agency under the Jurisdiction of the Deputy Chief of Staff for Personnel

JOSEPH ZEIDNER
Technical Director

FRANKLIN A. HART
Colonel, US Army
Commander

NOTICES

DISTRIBUTION Primary distribution of this report has been made by ARI. Please address correspondence concerning distribution of reports to: U. S. Army Research Institute for the Behavioral and Social Sciences, ATTN: PERI-TP, 5001 Eisenhower Avenue, Alexandria, Virginia 22333.

FINAL DISPOSITION This report may be destroyed when it is no longer needed. Please do not return it to the U. S. Army Research Institute for the Behavioral and Social Sciences.

NOTE The findings in this report are not to be construed as an official Department of the Army position, unless so designated by other authorized documents.

(18) AIKI

Unclassified

SECURITY CLASSIFICATION OF THIS PAGE (When Data Entered)

REPORT DOCUMENTATION PAGE

READ INSTRUCTIONS BEFORE COMPLETING FORM

1. REPORT NUMBER (19) RN- Research Note 80-19
2. GOVT ACCESSION NO. AD-A096 875 (9)
3. RECIPIENT'S CATALOG NUMBER Research note
4. TITLE (and Subtitle) (6) EXPERIMENTAL EVALUATION OF CONCEPTS FOR MIQSTURE; AN ONLINE INTERACTIVE LANGUAGE FOR TACTICAL INTELLIGENCE PROCESSING.
5. TYPE OF REPORT & PERIOD COVERED
6. PERFORMING ORG. REPORT NUMBER (14) OSI-R79050
7. AUTHOR(s) (10) Robert V. Katter and Gregg Bell
8. CONTRACT OR GRANT NUMBER(s) (15) MDA903-78-C-2044
9. PERFORMING ORGANIZATION NAME AND ADDRESS
Operating Systems Inc.
21031 Ventura Blvd.
Woodland Hills, CA 91364
10. PROGRAM ELEMENT, PROJECT, TASK AREA & WORK UNIT NUMBERS
29162717A790
11. CONTROLLING OFFICE NAME AND ADDRESS
U.S. Army Research Institute for Behavioral and Social Sciences (PERI-OS)
5001 Eisenhower Avenue, Alexandria VA 22333
12. REPORT DATE (11) 18 December 1979
13. NUMBER OF PAGES 102
14. MONITORING AGENCY NAME & ADDRESS (if different from Controlling Office) (12) 125
15. SECURITY CLASS. (of this report) Unclassified
15a. DECLASSIFICATION/DOWNGRADING SCHEDULE
16. DISTRIBUTION STATEMENT (of this Report)
Approved for public release; distribution unlimited
16 D.G.1.24L1A.1.P
17. DISTRIBUTION STATEMENT (of the abstract entered in Block 20, if different from Report)
18. SUPPLEMENTARY NOTES
19. KEY WORDS (Continue on reverse side if necessary and identify by block number)
User/computer interaction
Display design
Military systems
Tactical displays
Online Query Languages
20. ABSTRACT (Continue on reverse side if necessary and identify by block number)
A project was undertaken to evaluate selected aspects of an online language for Army tactical intelligence processing called MIQSTURE. In the first of two experiments reported here, U.S. Army tactical intelligence officers provided expert judgments on work-related and information utilization aspects of descriptions of selected tasks from Army tactical intelligence processing. The results provided indications of what query methods have potentials as aids for intelligence analysts. In the second experiment, an evaluation was made of the efficacy of a familiarization/refresher display arrangement for developing and

DD FORM 1 JAN 73 1473 EDITION OF 1 NOV 65 IS OBSOLETE

Unclassified

SECURITY CLASSIFICATION OF THIS PAGE (When Data Entered)

A 312914

maintaining a useful level of user/operator familiarity with little-used but essential elements of the interactive language. The results were promising for the display arrangement.

B 46

EXPERIMENTAL EVALUATION OF CONCEPTS FOR MIQSTURE; AN ONLINE INTERACTIVE LANGUAGE FOR TACTICAL INTELLIGENCE PROCESSING

Prepared for:

U. S. Army Research Institute
for the Behavioral and Social
Sciences
(PERI-OS)
5001 Eisenhower Avenue
Alexandria, VA 22333

OSI: R79-050

10 December 1979

Operating Systems, Inc.

21031 Ventura Boulevard, Woodland Hills, CA 91364

C

CONTENTS

EXPERIMENTAL EVALUATION OF CONCEPTS FOR MIQSTURE; AN ONLINE INTERACTIVE LANGUAGE FOR TACTICAL INTELLIGENCE PROCESSING

Robert V. Katter
Greg Bell

Operating Systems, Inc.

ABSTRACT

A project was undertaken to evaluate selected aspects of an online language for Army tactical intelligence processing called MIQSTURE. In the first of two experiments reported here, U. S. Army tactical intelligence officers provided expert judgments on work-related and information utilization aspects of descriptions of selected tasks from Army tactical intelligence processing. The results provided indications of what query methods have potential as aids for intelligence analysts.

In the second experiment, an evaluation was made of the efficacy of a familiarization/refresher display arrangement for developing and maintaining a useful level of user/operator familiarity with little-used but essential elements of the interactive language. The results were promising for the display arrangement.

1. FORWARD

This report covers the second year of work on a project to investigate the potentials of the mixed initiative type of interactive language for Army tactical intelligence processing applications. During the first year, a conceptual model for the language was developed and evaluated by expert judgment methods. In the second year, selected aspects of the language were studied in the field and laboratory. In a mixed initiative interaction language, both the user/operator and the system contribute active initiatives to maintaining a successful dialog to support ongoing interactive tasks. The potential advantages of the mixed initiative type of interactive language are especially important for Army tactical intelligence processing. Foremost is the fact that interaction with battlefield automated systems (of which tactical intelligence systems are one example) requires the processing of highly diverse information in a variety of contexts. Under such circumstances, system users have a great deal to remember. This is especially true as the pace of modern warfare radically increases the quantities of enemy and friendly information that must be handled while at the

same time curtailing the time available for processing the information for timely decision-making.

2. OVERVIEW

This report presents preliminary research to evaluate aspects of an online interaction language for user/operator-system interfaces for Army tactical intelligence processing systems called MIQSTURE (for Mixed Initiative Query Structure with Task and User Related Elements). The first study addressed the problem of securing design information from potential users for features of the language that can help cue the user/operator through complex task sequences. The second study investigated the effectiveness of learning arrangements in CRT displays for helping user/opefators to learn necessary alternative entry modes for boolean expressions and record element qualifiers that are used to search a file of records.

2.1 Background

The MIQSTURE concept anticipates the development of tactical intelligence systems using large automated data bases with data from a variety of sources. With such a system, the intelligence analyst could roam purposefully through data and ask a series of questions: "Where are enemy anti-aircraft radars located now?" "What were their positions twelve hours ago?" "How many main enemy supply routes have been identified?" "From what coordinates have there been reports of enemy armor activity?" Using queries such as these, the analyst could develop an understanding of the current situation and use it to produce an intelligence product. A mixed-initiative system would provide active support for the analyst's task. However, such support depends on having a computer system which has "knowledge" of task variables and relevant data.

The mixed initiative type of interactive language emphasizes computer-initiated contributions to the human-computer dialog. Both the machine subsystem and the user/operator play active roles in contributing initiatives to the interactive dialog. The computer actively contributes by, for example, volunteering information appropri-

ate to the intent of a query; by "stepping" the user/operator through a complex series of task steps by prompting and providing cues and directions; by diagnosing user/operator errors through sensing the interactive context; by providing highly specific "context sensitive" feedback for errors and for user/operator requests for help; by monitoring tasking input streams and notifying the user/operator of items relevant to his/her assignments; by embedding associative learning display mechanisms in message presentation formats and command term abbreviation arrangements; by volunteering online tutorials as part of help procedures; by keeping a record of ongoing transactions with easy immediate re-display for the user/operator; by allowing flexible multiple means for inserting parameters for most commands; by allowing various forms of individualization of the language for each user; and, by automatically invoking the various individualized features when a user/operator signs on the system.

From the above examples it can be seen that the two main characteristics of a mixed-initiative language are:

1. To provide support to the user's limited memory for the *terms and conventions* of the interactive language. These include ability to accept commands and parameter specifications in memory-supportive formats such as menu selection and fill-in-the-blank formats, and term-tolerance arrangements for the use of synonyms, idiomatic forms of expression, and correction of typographical and spelling errors. Menu selection and fill-in-the-blank formats can sharply reduce the requirements for recalling the exact "correct" forms of input expressions, requiring instead that the user only recognize and select the desired form when it is displayed. Term-tolerance arrangements allow for alternative keyed-in strings of characters (synonyms or idiomatic expressions) to be "recognized " as serving the same communicative function by the system, thus reducing the load on the user's memory of recalling only one precise form. The same type of arrangements can

be used to have the system make approximative "guesses" at the correct term intended for a misspelled term or a typographical error. When a successful guess is made by the system (which is usually the case) the user need only indicate this by a single keystroke, rather than re-keying the entire misspelled term.

2. To *anticipate* user/operators' needs for other types of memory aids related to the structure and sequence requirements of complex tasks performed interactively. In the latter role the system is provided with a range of corrective information that it can make available in the event the user/operator fails to remember a complex sequence of steps in a task. Such aids are provided by the system on three bases:

   - The user/operator may recognize a specific need and provide the system a "name" or description of the type of aid needed
   - The user/operator may signal that a need for memory support exists, but be unable to specify the required form of help-- in which case the system attempts to diagnose the probable range of needs on the basis of sensing the current state of the interactive context, and offers a selection to choose from;
   - Without being asked, the system may sense a probable need for memory support to the user/operator on the basis of the status of the current interactive context, and offer unobtrusive aid which the user/operator may accept or ignore.

The research reported here was designed to determine whether selected features of the MIQSTURE language are compatible with tactical intelligence processing. The first step was to collect information regarding user (e.g., analyst, commander) requirements. Then, features of MIQSTURE specifically designed for the intelligence process were explored and evaluated. The two types of features selected for

study in the present project were: displays for prompting the user through complex sequences of steps in an interactive task, and displays for learning necessary alternative forms for entering queries used to search files of records.

3. TASK KNOWLEDGE FOR TASK-STEP DISPLAYS

3.1 Introduction

The task-step prompting display features of MIQSTURE were proposed as a way to make the interactive computer program more of a partner with the user in accomplishing complex tasks (MIQSTURE: AN EXPERIMENTAL ONLINE LANGUAGE FOR ARMY TACTICAL INTELLIGENCE INFORMATION PROCESSING. ARI Technical Report No. TR-78-A25, July 1978. (AD A064 323).

While the human task performer has in mind purposes and possible outcomes and past history of an ongoing task process, the program is devoid of such knowledge. This major shortcoming of the machine complicates and limits the user/system dialog. One objective of the present research was to develop and test procedures which would allow the machine to accept and store task-structure knowledge, and to use it in the course of interactive dialogs.

3.2 Background

Task knowledge is knowledge about a *particular* task. The task knowledge we wish to provide our computer system has several characteristics important from the point of view of system design:

1. It must be provided by persons intimately familiar with the details of each identifiable task.
2. It must be constrained to *reliable* generalizations about relations between given sets of conditions and the task steps and substeps they imply or involve. Variations in relations between conditions and task steps must be expressed in unequivocal terms or else cannot be part of the machine's task knowledge.
3. The quality, level of detail, and usefulness of task knowledge for the system is dependent upon the effectiveness of the means provided to inform the system.

The present pilot research was undertaken to provide an initial indication of *specific* information that intelligence analysts require to perform intelligence tasks in a *non-*automated (manual) environment. These data were gathered to determine if there is a useful degree of *consensus* among analysts about intelligence processing subtasks and procedures, which could provide guidance for query language design. To implement the research, opinions were sought from analysts about selected procedures used to process intelligence.

3.3 Method Summary

The requirements for the pilot research were that the procedures must be focused on the intelligence area and be appropriate to the skill/knowledge of available participants. To satisfy the requirements, task descriptions to serve as stimuli were selected with the advice of staff personnel at the U. S. Army Intelligence Center and School (USAICS), Ft. Huachuca, Arizona, and from documents, including The Combat *Electronic Warfare Intelligence Operations Center* Automated Functional Analysis Study (CEWIOCAFAS), and USAICS' Hierarchical plus Input Process Output Charts. Fourteen officers from advanced courses in army tactical intelligence at USAICS were identified by staff personnel as having experience appropriate to the selected task descriptions. Each officer in the sample contributed two and one-half hours to the research.

The officers participated in groups of two (in one case three), for each session. The sessions were conducted in five steps:

1. Initial explanations and examples were provided to the participants.
2. Each participant then read completely through the task descriptions, and ranked them according to degree of familiarity.
3. The first task in the booklet (See Appendix A, task 2.1.2.1.--Determine Source Reliability) was then used for practice, without regard to familiarity rankings for

that task. In working the example, participants filled out a single MIQSTURE response form (Appendix B) for that task with guidance from the project team as needed.

4. Participants then proceeded to fill out one additional form for each task description they had ranked as familiar (2, 3, or 4, depending upon the rate at which they worked). The first form was for their most familiar task, the second was for the next most familiar task, and so on.

5. After completing the response forms, a group debriefing discussion was held among the two or three participants and the two or three project team members.

3.4 Detailed Procedures and Materials

The Task Description Booklet (Appendix A) and the MIQSTURE response form (Appendix B) were the only materials used by research participants. Explanation of the research purposes coincided with major points made in the introductory section of this report. They were given in an informal manner, usually occupying about ten minutes followed by questions and clarifications. In the last part of the introductory step participants were asked to read the explanation on the cover page of the response booklet (see Appendix B). In the booklet, the items taken from the CEWIOCAFAS appear on the left half of each page; corresponding items on the right side of each page are descriptions of hypothetical automated versions of the tasks developed by the project team. The automated versions were included to provide participants with concrete examples of the ways in which manual tasks of the CEWIOCAFAS might be carried out using an automated system. The purpose was one of stimulating interest and new perspectives for the judgments called for in the MIQSTURE response form.

Responses were made directly on the form provided, and all items except number ten had a six-point rating scale. One task description, concerning intelligence collection

management, was administered only to the single participant who had exceptional familiarity with that task. Data from a fourteenth participant were unusable because the tasks that were rated were not identified on the response form. Rating scale descriptions differed, depending on the purpose of the item. At the bottom of every page, a place was provided for comments. For many of the items, space also was provided for additional clarification about a particular response.

Project team members were available for questions during the session, but very few requests were made for clarifications. Respondents were free to take a break whenever they desired. When all participants in a session had completed their response forms, a break was suggested, and then a debriefing discussion was held lasting for twenty minutes to more than an hour. Discussion was informal and open-ended, but the project team assured that the following points were covered:

- Did the participants have any relevant experiences or opinions to share with the project team?
- What were the participants' impressions of the session: Did they find the tasks difficult or easy; if so, which parts? Could they see any ways in which such activities might benefit the Army; if so how?
- Did the participants have any opinions about automating Army tactical intelligence processing?

3.5 Presentation of Results

Results are considered in the following order:

1. Task Familiarity Rankings
2. Frequency of Non-Responses for Items Combined across Tasks
3. Frequency Distributions of ratings for Items by Individual Task
4. Comments on Items for Individual Tasks

5. Debriefing Comments

3.5.1 Task Familiarity Rankings

Data for Task Familiarity are summarized in Table 1.

BKLT SEQN	CEWIOC NUMBER	NAME OF TASK DESCRIPTION	CHOICE FREQ.	MEAN RANK
3	2.1.2.3	Post Collateral Enemy Order of Battle	11	1.18
1	2.1.2.1	Determine Source Reliability	5	2.60
5	2.1.2.5	Maintain Friendly Situation Overlay	5	2.60
4	2.1.2.4	Maintain Intelligence Workbook	4	3.00
8	3.1.2.1	Determine Resource Availability	4	2.75
2	2.1.2.2	Post Electronic Enemy O.of B. Map	3	2.00
9	3.1.2.2	Determine Resource Capability	3	2.33
6	2.1.2.6	Maintain Templating File	3	2.60
10	3.1.2.3	Identify Other Sources	2	3.00
12	3.1.1.2	Determine Indicators	1	2.00
7	3.1.1.4	Review Collection Planning File	1	3.00

Table 1: Task Familiarity Rankings

Proceeding from the left, the first three column headings of Table 1 show the sequence of tasks in the task description booklet, the CEWIOCAFAS classification numbers for a task, and the associated task name. Task descriptions are rank-ordered from the top to the bottom of the table by their overall familiarities to the intelligence officer participants in the research. The Choice Freq. column depicts the number of participants (in the total sample of thirteen officers) who ranked that task description as familiar enough to be chosen among the ones to be rated later in the session. The Mean Rank column shows the arithmetic mean of familiarity rankings for each task description, with the value 1.0 signifying the greatest familiarity, and 6.0 indicating least familiarity. The number of participants for Task 2.1.2.1--Determine Source Reliability--was actually thirteen, because that task was used as the work-through example by all participants. However, the number of participants who chose the task on the basis of their preceding task familiarity rankings was five, which is the choice frequency indicated in Table 1.

The booklet sequence position of task description 3.1.1.2--Determine Indicators-- is given as 12 in Table (which is its position as shown in Appendix A). However, for twelve of the thirteen participants, only the first ten task descriptions (through 3.1.2.3--Identify Other Sources) were shown because of previously obtained information about the relative familiarities that participants had with the various tasks described.

When the three most familiar task names (top three in Table 1), are compared with the three least familiar ones (bottom three), there is an apparent difference in quality. The more familiar tasks seem associated with more immediate processing urgency in terms of placing incoming information *into an overall context* as soon as possible, provided the information is reliable. The least familiar tasks appear to be associated with activities that may be somewhat less time-pressured, such as planning efficient future information gathering, and assuring the maximum feasible coverage. Given that this interpretation is valid, these results indicate that the task familiarity rankings of the intelligence officer participants were based on a common viewpoint about which activities are of highest priority in performing intelligence analysis and which therefore receive more attention. Such results could also have been an artifact due to the order of presentation in the task booklet (with earlier descriptions being rated more familiar). The circumstances, however, do not lend strong support to this interpretation, because all items were read through before familiarity was rated. In fact, booklet sequence numbers are only moderately correlated with the familiarity rank order of items shown in the table ($r=.68$). In summary, analyst orientations toward task value and priority appeared to be reasonably consistent between participants, and were determinable by the kinds of techniques used in this study.

3.5.2 *Analysis of Response Form Items for Tasks*

The columns in Table 2 show, from left to right, item numbers (corresponding to their positions in the response form), frequencies of NO ANSWER responses for each item, and an abbreviated text for each item. Logical sub-parts of a task are referred to as "steps" or "task steps". Items appear in the table in the rank order of their NO ANSWER frequencies.

Table 2: Frequency of non-responses to items

ITEM NO.	N/A FREQ	ABBREVIATED TEXT ITEM
12	14	How EASY is it to identify data needed from earlier steps?
13	11	How READILY ACCESSIBLE are needed data from earlier steps?
10	9	Is this step dependent on completion of other steps? Describe.
14	8	How USEFUL is task step checkoff capability as a CURRENT reminder?
11	7	How OFTEN are earlier step data NECESSARY to the present step?
16	7	To store task-step OUTCOMES, how useful is menu type checkoff?
15	6	How USEFUL is task step checkoff capability as LATER REVIEW store?
3	5	Are activities in TASK STEP right in relation to surrounding steps?
18	5	How USEFUL for step outcome store is free typing entry capability?

(continued next page)

17	4	How USEFUL for step outcome store is blank fill-in capability?
9	4	In this STEP, the NUMBER of items to be RECALLED by MEMORY is:
5	4	Is this STEP concerned with NON-DEFERRABLE actions on data?
4	3	Can the ACTIVITIES of this STEP be ELIMINATED if necessary?
8	3	In this STEP, the NUMBER of items needing CONCURRENT ATTENTION is:
7	3	How DEMANDING is this STEP in requiring your TIME and THOUGHT?
6	3	Can the ACTIVITIES of this STEP be SHORTENED or DEGRADED if need?
2	3	Please comment on DETAIL OF DESCRIPTION of task STEP:
1	0	How USEFUL is task STEP DESCRIPTION for CUEING and PROMPTING?

The rank-order clusterings of items in Table 2 suggest a patterning in the responses. Starting at the top of the table is a group of items (12, 13, 10) which received fewer responses than all other items. The three items of this cluster asked for responses about relationships among task steps in task processes. At the bottom of the table appears a cluster of the first two (easiest to answer) items (1, 2), which asked for opinions about the descriptive TEXTS for the tasks. The succeeding six items (6,7,8,4,5,9) ask for evaluative opinions about tasks themselves. Finally, the remaining sequence of items (17,18,3,15,16,11,14) are about an equal mixture of two kinds of items; those asking for evaluative opinions about the usefulness of interactive capabilities for keeping track of tasks, and those asking for opinions about the relationships among task steps in more inclusive task processes.

As a working hypothesis, there seem to be a systematic pattern in the degrees of

confidence with which the intelligence officer participants answered questions about intelligence processing tasks and the implications for automation. An alternate possibility is that results for the rank-order of frequencies were an artifact of serial positions of the items in the response form. This is unlikely, since there is only a slight relationship ($r=.32$) between the rank order of NO ANSWER response frequencies of items and their serial positions in the response form. Overall, the response form emerges as a reasonable source of data about the intelligence process.

3.5.3 Ratings of Response Items for Individual Tasks

Distributions of ratings on given items were developed for each task description. Individual items with responses for each of the tasks are shown in Tables 3 through 18. Appendix C summarizes the same data separately for each task. Since the average response frequencies for individual tasks was small due to the limited number of participants, no statistics were computed and results were analyzed using visual comparisons of data distributions. Ratings for various tasks on each item are discussed together.

Task	NA	1	2	3	4	5	6
2.1.2.3 Post Collateral Enemy O of B		6	2	1		2	
2.1.2.1 Determine Source Reliability		1	2	6		1	3
2.1.2.5 Maint. Friendly Sit. Overlay		2		1	1	1	
2.1.2.4 Maintain Intelligence Wrkbook			2	1			1
3.1.2.1 Determine Resource Available		1	1	1			1
2.1.2.2 Post Eltrnc O of B Battle Map		1	1			1	
3.1.2.2 Determine Resource Capability			2			1	
2.1.2.6 Maintain Templating Files			1			1	1
3.1.2.3 Identify Other Sources			1				1
3.1.1.2 Determine Indicators			1				
3.1.1.4 Review Collection Plan File			1				

Table 3 (Item 1)

Item 1: "How useful is this task step description for cueing and prompting the performer about what to do?" 1--Extremely useful, to 6--Of little use.

All participants rated this item--perhaps indicating considerable participant confidence in providing an answer to it. However, there was only scattered consensus (i.e., no tight frequency clusters within rating distributions) for the eleven tasks. Responses to task description 2.1.2.3--(Post Collateral Enemy Order of Battle) clustered around a rating of "extremely useful", with a possible trend in this direction for task 3.1.2.1--(Determine Resource Availability). Most other distributions were scattered, with the number of responses too small to discern any clear pattern.

Task	NA	1	2	3	4	5	6
2.1.2.3 Post Collateral Enemy O of B				7	4		
2.1.2.1 Determine Source Reliability		1	2	6	3		1
2.1.2.5 Maint. Friendly Sit. Overlay		1	1	2	1		
2.1.2.4 Maintain Intelligence Wrkbook				3			1
3.1.2.1 Determine Resource Available		1	1	1	1		
2.1.2.2 Post Eltrnc O of B Battle Map				3			
3.1.2.2 Determine Resource Capability		1		2			
2.1.2.6 Maintain Templating Files		1			1		1
3.1.2.3 Identify Other Sources		1		1			
3.1.1.2 Determine Indicators				1			
3.1.1.4 Review Collection Plan File				1			

Table 4 (Item 2)

Item 2: "Please comment on the LEVEL OF DESCRIPTION of the task step." 1--Too General, to 6--Too Detailed.

Most ratings for the item clustered near the scale's midpoint, with some tendency in the direction of "too general". None of the individual task rating distributions cluster close to either extreme of the scale.

Task	NA	1	2	3	4	5	6
2.1.2.3 Post Collateral Enemy O of B		2		8	1		
2.1.2.1 Determine Source Reliability	1	2		6	3	1	
2.1.2.5 Maint. Friendly Sit. Overlay				3	1	1	
2.1.2.4 Maintain Intelligence Wrkbook	1			3			
3.1.2.1 Determine Resource Available	1	1			1		1
2.1.2.2 Post Eltrnc O of B Battle Map				2		1	
3.1.2.2 Determine Resource Capability				1	1		1
2.1.2.6 Maintain Templating Files	1				2		
3.1.2.3 Identify Other Sources	1		1				
3.1.1.2 Determine Indicators					1		
3.1.1.4 Review Collection Plan File					1		

Table 5 (Item 3)

Item 3: "Are the task step BOUNDARIES (beginning, end) correct in relation to the other task steps surrounding it?" 1--Many activities in this step should be put in other steps, to 6--Many activities in other steps should be put in this step.

The modal response to this item across all tasks falls at "just about right", with the occasional possibility that tails of individual task distributions would favor one or another scale extreme if more cases were available.

Task	NA	1	2	3	4	5	6
2.1.2.3 Post Collateral Enemy O of B	1		1	1		1	7
2.1.2.1 Determine Source Reliability			2	7	1	3	
2.1.2.5 Maint. Friendly Sit. Overlay				2		1	2
2.1.2.4 Maintain Intelligence Wrkbook			1			1	2
3.1.2.1 Determine Resource Available	1					1	2
2.1.2.2 Post Eltrnc O of B Battle Map						1	2
3.1.2.2 Determine Resource Capability						1	2
2.1.2.6 Maintain Templating Files						1	2
3.1.2.3 Identify Other Sources	1						1
3.1.1.2 Determine Indicators						1	
3.1.1.4 Review Collection Plan File					1		

Table 6 (Item 4)

Item 4: "Can the activities of this step be eliminated if necessary?" 1--Always, to 6--Never.

There are some noticeable trends toward clustering for some tasks. Examples are a "never" cluster for task 2.1.2.3--(Post Collateral Enemy Order of Battle), a "sometimes" cluster for 2.1.2.1--(Determine Source Reliability), and possible "never" clusters for most other tasks. The only deviation from a "never" rating occurred for the Determine Source Reliability task. It is explained by written comments on the forms and verbal comments in the debriefing sessions. Participants suggested that the reliability of most commonly used sources is pre-determined and quite constant over a given period of time, and/or is determined by personnel nearer the data sources in most cases. From this point of view, determining source reliability would often be relatively superfluous for many known message sources. In general, all of the tested tasks seem to be necessary parts of the intelligence analyst's job.

Task	NA	1	2	3	4	5	6
2.1.2.3 Post Collateral Enemy O of B	1	5	4	1			
2.1.2.1 Determine Source Reliability	1	1	5	1	1	4	
2.1.2.5 Maint. Friendly Sit. Overlay		2	1		1	1	
2.1.2.4 Maintain Intelligence Wrkbook		1	1		2		
3.1.2.1 Determine Resource Available	1		1	1	1		
2.1.2.2 Post Eltrnc O of B Battle Map		3					
3.1.2.2 Determine Resource Capability		1		1		1	
2.1.2.6 Maintain Templating Files		1	1		1		
3.1.2.3 Identify Other Sources	1				1		
3.1.1.2 Determine Indicators				1			
3.1.1.4 Review Collection Plan File		1					

Table 7 (Item 5)

Item 5: "Is this step concerned with non-deferrable actions (i.e., with processing crucial, perishable data)? 1--Always, to 6--Never.

This item appears to distinguish somewhat among tasks. The ratings for 2.1.2.3--(Post Collateral Enemy Order of Battle) appear to cluster well toward the "always" portion of the scale, as do the data for 2.1.2.2--(Post Electronic Enemy Order of Bat-

tle), and 2.1.2.6--(Maintain Templating Files). However, ratings for 2.1.2.1--(Determine Source Reliability) are bimodal, having one subgroup of the distribution well over toward the "never" scale position, and another subgroup toward the "Always" rating. This latter result fits well with the earlier item 4 findings for that task. The data suggest that opinions on deferring many of the other tasks might also prove to be variable among participants, but there are insufficient response frequencies to support any firm conclusion.

Task	NA	1	2	3	4	5	6
2.1.2.3 Post Collateral Enemy O of B	1		1	4		3	2
2.1.2.1 Determine Source Reliability		1	1	6	1	3	1
2.1.2.5 Maint. Friendly Sit. Overlay			1	2		1	1
2.1.2.4 Maintain Intelligence Wrkbook			1		1	1	1
3.1.2.1 Determine Resource Available			1	1			2
2.1.2.2 Post Eltrnc O of B Battle Map	1			1			1
3.1.2.2 Determine Resource Capability				3			
2.1.2.6 Maintain Templating Files				1	1		1
3.1.2.3 Identify Other Sources	1				1		
3.1.1.2 Determine Indicators					1		
3.1.1.4 Review Collection Plan File				1			

Table 8 (Item 6)

Item 6: "Can the activities of this step be shortened or degraded if necessary?" 1--Always, to 6--Never.

For this item, the rating distributions show considerable scatter for most tasks, suggesting that there may be somewhat more differences in points of view about shortening task activities than about deferring or eliminating them. Note, for example, that results for Tasks 2.1.2.3 and 2.1.2.1 on this item disagree with data from Items 4 and 5.

One possible reason for this variability is the unfortunate use of the word "degrade" in the item's text. This may have carried a strong negative connotation to some judges and not to others. Another possibility is that some participants knew ways to shorten work activities without seriously affecting results, while others did not.

Task	NA	1	2	3	4	5	6
2.1.2.3 Post Collateral Enemy O of B	1	2	5	1	1	1	
2.1.2.1 Determine Source Reliability	1	2			3	4	3
2.1.2.5 Maint. Friendly Sit. Overlay				1	1	3	
2.1.2.4 Maintain Intelligence Wrkbook		1	1	2			
3.1.2.1 Determine Resource Available		1		1		2	
2.1.2.2 Post Elrnc O of B Battle Map		1	1	1			
3.1.2.2 Determine Resource Capability		1			1	1	
2.1.2.6 Maintain Templating Files		1	2				
3.1.2.3 Identify Other Sources	1		1				
3.1.1.2 Determine Indicators					1		
3.1.1.4 Review Collection Plan File				1			

Table 9 (Item 7)

Item 7: "How demanding is this task step in requiring your time and thought?" 1--Extremely demanding, to 6--Extremely un-demanding.

This item appeared to differentiate among tasks. The tasks rated as more demanding were: 2.1.2.3--(Post Collateral Enemy Order of Battle); 2.1.2.4--(Maintain Intelligence Workbook); 2.1.2.2--(Post Electronic Enemy Order of Battle Map), and 2.1.2.6--(Maintain Templating File). Tasks rated as less demanding were: 2.1.2.1--(Determine Source Reliability); and, 2.1.2.5--(Maintain Friendly Situation Overlay).

Some of the task steps that showed differences for rating item 4 (Can the step be eliminated?) showed similar differences on item 7 (How demanding of thought and time is the step?). Ratings show that the Posting of Collateral Enemy Order of Battle should not be eliminated and that it is usually quite demanding on thought and time. Similarly, Maintaining Intelligence Workbook and Posting Electronic Enemy Order of Battle Map cannot be eliminated and are very demanding on time and thought. In contrast, Determination of Source Reliability can sometimes be eliminated and is not so demanding of time and thought. The correlation between results in Items 4 and 7, however, does not necessarily indicate that more demanding tasks are also more necessary.

Two alternative interpretations of this general pattern can be made. One is that the experience of most of the participants has been mostly with tasks characterized

above as "high-priority", and that this is mainly what determines their ratings of those tasks as having been most demanding of their time and thought. The other possibility is that the participants have had approximately equal amounts of experience with all the tasks presented, and that rating the demandingness of tasks reflects their true differential nature. The present data do not allow an unequivocal choice to be made between the two interpretations.

Task	NA	1	2	3	4	5	6
2.1.2.3 Post Collateral Enemy O of B	1	3	3	2	1	1	
2.1.2.1 Determine Source Reliability	1		2	1	3	3	3
2.1.2.5 Maint. Friendly Sit. Overlay			1		2	2	
2.1.2.4 Maintain Intelligence Wrkbook		2		2			
3.1.2.1 Determine Resource Available		1	1		1	1	
2.1.2.2 Post Eltrnc O of B Battle Map			1	2			
3.1.2.2 Determine Resource Capability		1			1	1	
2.1.2.6 Maintain Templating Files		3					
3.1.2.3 Identify Other Sources	1			1			
3.1.1.2 Determine Indicators			1				
3.1.1.4 Review Collection Plan File				1			

Table 10 (Item 8)

Item 8: In this step, the number of different items needing more or less simultaneous attention is:". 1--Very Large, to 6--Very Small.

Task steps 2.1.2.3--(Post Collateral Enemy Order of Battle), and 2.1.2.4--(Maintain Intelligence Workbook) show tendencies to cluster around "very large", while task steps 2.1.2.1.--(Determine Source Reliability), 2.1.2.5--(Maintain Friendly Situation Overlay) and 2.1.2.6--(Maintain Templating Files) show tendencies to cluster around medium-small. Ratings of tasks on the number of items requiring simultaneous attention, on Item 7, demands for time and thought, and on Item 5, task non-deferrability, all appear to tap a somewhat common perception of the tasks. However, data variability suggests that the three kinds of ratings are not identical.

Task	NA	1	2	3	4	5	6
2.1.2.3 Post Collateral Enemy O of B	1	4		4		1	1
2.1.2.1 Determine Source Reliability	1	3	1	2		4	2
2.1.2.5 Maint. Friendly Sit. Overlay			1		3	1	
2.1.2.4 Maintain Intelligence Wrkbook	1	1		1		1	
3.1.2.1 Determine Resource Available		1	1		1	1	
2.1.2.2 Post Eltrnc O of B Battle Map			1	1			1
3.1.2.2 Determine Resource Capability		1		1	1		
2.1.2.6 Maintain Templating Files		1	1	1			
3.1.2.3 Identify Other Sources	1		1				
3.1.1.2 Determine Indicators			1				
3.1.1.4 Review Collection Plan File				1			

Table 11 (Item 9)

Item 9: "In this step, the number of items that must be recalled BY MEMORY is:". 1--Very large, to 6--Very small.

Task 2.1.2.3--(Post Collateral Enemy Order of Battle) shows rating clusters toward "very large", while task 2.1.2.5--(Maintain Friendly Situation Overlay) clusters toward "small". The reasons for these differences were not apparent from comments. Examination of distributions for other tasks suggests that ratings for this item may be more scattered than for the previous two items (demand on time and thought; steps needing simultaneous attention). A possibility is that a larger sample might show that consensus on judgments about memory demands is less than for judgments about time, thought, and attention demands. Although it is clear that memory demands often may be quite great in intelligence information processing and analysis, it may be that memory functioning (and malfunctioning) is "automatic" for the most part, and ordinarily escapes the notice of analysts.

Task	NA	1	2	3	4	5	6
2.1.2.3 Post Collateral Enemy O of B	1		Y=10			N=0	
2.1.2.1 Determine Source Reliability	1		Y=8			N=4	
2.1.2.5 Maint. Friendly Sit. Overlay			Y=3			N=2	
2.1.2.4 Maintain Intelligence Wrkbook	1		Y=1			N=2	
3.1.2.1 Determine Resource Available	2		Y=1			N=1	
2.1.2.2 Post Eltrnc O of B Battle Map	1		Y=1			N=1	
3.1.2.2 Determine Resource Capability	1		Y=2			N=0	
2.1.2.6 Maintain Templating Files	1		Y=2			N=0	
3.1.2.3 Identify Other Sources	1		Y=1			N=0	
3.1.1.2 Determine Indicators			Y=0			N=1	
3.1.1.4 Review Collection Plan File			Y=1			N=0	

Table 12 (Item 10)

Item 10: "Is this step dependent on the completion of other steps? Yes/No. Describe prerequisite step(s). Why is the step prerequisite?"

Although the response frequencies are very small, about three times as many of the tasks appear to be judged as dependent on completion of earlier steps as were judged to be independent of earlier steps. Task 2.1.2.3--(Post Collateral Enemy Order of Battle) and task 2.1.2.1--(Determine Source Reliability) were consistently judged as dependent on the completion of ot. steps. The CARRYOVER of data and results from task step to task step in intelligence processing may create extra burdens on the analyst to manipulate materials and data. Such demands on the short-term memory of analysts might be reduced by the use of automation aids which help in sequencing and storing information.

Some of the main dimensions of task step dependencies are illuminated by commentaries concerning prerequisite steps and the reasons they are prerequisite. Seven commentaries mentioned as prerequisites the referencing and maintenance of Enemy Order of Battle information (file version, workbook version, journal version) for purposes of putting new enemy information into an enemy organizational ID context. Four commentaries mentioned determination of data and/or source reliability as a prerequisite to further use of the data. Four mentioned track correlation processing of new data as a prerequisite to prevent duplication, redundancy and clutter, and to

allow removal of older data points on the same enemy objects and activities. Two commentaries mentioned message logging and control as prerequisites, and two mentioned checkoff for Essential Elements of Information and Other Required Information. From these comments, it appears that different participants tend to recall different kinds of prerequisites. This suggests that a checklist of prerequisite types might well produce more consistent data between participants.

Task	NA	1	2	3	4	5	6
2.1.2.3 Post Collateral Enemy O of B	1	3	2	1		2	2
2.1.2.1 Determine Source Reliability	3	3	4	1	1		1
2.1.2.5 Maint. Friendly Sit. Overlay		1	2		1		1
2.1.2.4 Maintain Intelligence Wrkbook	1		1		1		1
3.1.2.1 Determine Resource Available		3				1	
2.1.2.2 Post Eltrnc O of B Battle Map			1	1			1
3.1.2.2 Determine Resource Capability		1	1	1			
2.1.2.6 Maintain Templating Files	1		2				
3.1.2.3 Identify Other Sources	1			1			
3.1.1.2 Determine Indicators						1	
3.1.1.4 Review Collection Plan File				1			

Table 13 (Item 11)

Item 11: "How OFTEN are such earlier-developed data NECESSARY to the present step?" 1--Always, to 6--Never.

Scanning of the response distributions reveals no tendencies for tight clustering, with the possible exception of an "always" cluster on task step 3.1.2.1--(Determine Resource Availability). For task 2.1.2.3--(Post Collateral Enemy Order of Battle) responses between item 10 and 11 are somewhat inconsistent. For item 10 no participants rated the task on the "never" half of the scale, but 4 participants rated the task on the "never" half of the scale for item 11, which shows a bipolar distribution for the task. None of the comments appear to shed any light on this inconsistency.

Task	NA	1	2	3	4	5	6
2.1.2.3 Post Collateral Enemy O of B	4	2	3	1			1
2.1.2.1 Determine Source Reliability	3	3	3	2	1		1
2.1.2.5 Maint. Friendly Sit. Overlay	2		2			1	
2.1.2.4 Maintain Intelligence Wrkbook	1		1		1	1	
3.1.2.1 Determine Resource Available	1	2	1				
2.1.2.2 Post Eltrnc O of B Battle Map	1		1	1			
3.1.2.2 Determine Resource Capability			1	1		1	
2.1.2.6 Maintain Templating Files	1		1		1		
3.1.2.3 Identify Other Sources	1			1			
3.1.1.2 Determine Indicators							1
3.1.1.4 Review Collection Plan File				1			

Table 14 (Item 12)

Item 12: "How EASY is it to identify the kinds of data needed from earlier steps?" 1--Very easy, to 6--Very difficult.

Scanning of the response distributions shows few extreme clusters. There were "Very easy" clusters for task steps 3.1.2.1--(Determine Resource Availability), 2.1.2.3--(Post Collateral Enemy Order of Battle), and 2.1.2.1--(Determine Source Reliability), and a "Very difficult" rating from the single participant who rated task step 3.1.1.2--(Determine Indicators). These results, though based on minimum data, appear to make sense given the demands of these task-steps compared to others in the study.

Task	NA	1	2	3	4	5	6
2.1.2.3 Post Collateral Enemy O of B	3	3	1	2	1	1	
2.1.2.1 Determine Source Reliability	3		3	1	2	3	1
2.1.2.5 Maint. Friendly Sit. Overlay	1	1	2			1	
2.1.2.4 Maintain Intelligence Wrkbook		1	1	1	1		
3.1.2.1 Determine Resource Available	1				2		1
2.1.2.2 Post Eltrnc O of B Battle Map	1			1		1	
3.1.2.2 Determine Resource Capability			1		1		1
2.1.2.6 Maintain Templating Files	1				1	1	
3.1.2.3 Identify Other Sources	1					1	
3.1.1.2 Determine Indicators					1		
3.1.1.4 Review Collection Plan File					1		

Table 15 (Item 13)

Item 13: "How READILY ACCESSIBLE are the needed data from earlier steps (e.g., in sitmaps, message files, your memory, etc.)?" 1--Readily accessible, to 6--

Inaccessible.

Scanning of the response distributions suggests that this item was better than item 12 at discriminating between task steps. The response distributions for task steps 2.1.2.3--Post Collateral Enemy Order of Battle) and 2.1.2.5--(Maintain Friendly Situation Overlay) show clustering trends in the region of "usually accessible", while the distribution for step 3.1.2.1--(Determine Resource Availability) suggests a trend toward "somewhat inaccessible". The pattern for most other tasks with three or more data points reflects considerable scattering of opinion.

Task	NA	1	2	3	4	5	6
2.1.2.3 Post Collateral Enemy O of B	1	1	1	4	2		2
2.1.2.1 Determine Source Reliability	2	1	5	1	1	2	1
2.1.2.5 Maint. Friendly Sit. Overlay	1		1	1	1		1
2.1.2.4 Maintain Intelligence Wrkbook		1		1		2	
3.1.2.1 Determine Resource Available	1		1	1		1	
2.1.2.2 Post Eltrnc O of B Battle Map	1					1	1
3.1.2.2 Determine Resource Capability			1	1			1
2.1.2.6 Maintain Templating Files	1		1	1			
3.1.2.3 Identify Other Sources	1			1			
3.1.1.2 Determine Indicators		1					
3.1.1.4 Review Collection Plan File		1					

Table 16 (Item 14)

Item 14: "For the task performer, how useful would it be to check off each step in a task as an aid for remembering that the step was accomplished, deferred, deleted, short-cut, etc?" 1--Highly useful, to 6--Of little use.

Task 2.1.2.1--(Determine Source Reliability) shows a clustering tendency toward "very useful", while task 2.1.2.2--(Post Electronic Enemy Order of Battle Map) suggests a cluster around "of little use". Other tasks show no discernible clusters.

Task	NA	1	2	3	4	5	6
2.1.2.3 Post Collateral Enemy O of B	1	2		2		2	4
2.1.2.1 Determine Source Reliability	2	1	1	3	1	2	3
2.1.2.5 Maint. Friendly Sit. Overlay		1	1	1		1	1
2.1.2.4 Maintain Intelligence Wrkbook	1				1	2	1
3.1.2.1 Determine Resource Available					1	1	1
2.1.2.2 Post Eltrnc O of B Battle Map			1			1	1
3.1.2.2 Determine Resource Capability				1	1		1
2.1.2.6 Maintain Templating Files	1		1				1
3.1.2.3 Identify Other Sources	1				1		
3.1.1.2 Determine Indicators							1
3.1.1.4 Review Collection Plan File		1					

Table 17 (Item 15)

Item 15: "How useful would a check off system (as in item 14) be for LATER review and critique of ones OWN performance?" Responses were about equally split between "highly useful" and "of little use". Distributions for tasks 2.1.2.4--(Maintain Intelligence Workbook) and 3.1.2.1--(Determine Resource Availability) suggest clusters toward "of little use".

Task	NA	1	2	3	4	5	6
2.1.2.3 Post Collateral Enemy O of B	2	2	2	3		1	1
2.1.2.1 Determine Source Reliability	1	3	4		2	1	2
2.1.2.5 Maint. Friendly Sit. Overlay		1				1	3
2.1.2.4 Maintain Intelligence Wrkbook	1			1		1	1
3.1.2.1 Determine Resource Available	1				1	1	1
2.1.2.2 Post Eltrnc O of B Battle Map		1					2
3.1.2.2 Determine Resource Capability	1		1	1			
2.1.2.6 Maintain Templating Files			1	1			1
3.1.2.3 Identify Other Sources	1			1			
3.1.1.2 Determine Indicators			1				
3.1.1.4 Review Collection Plan File			1				

Table 18 (Item 16)

Task	NA	1	2	3	4	5	6
2.1.2.3 Post Collateral Enemy O of B	2	2	3	2			2
2.1.2.1 Determine Source Reliability		1	4	1		4	3
2.1.2.5 Maint. Friendly Sit. Overlay			1			1	3
2.1.2.4 Maintain Intelligence Wrkbook		1				1	2
3.1.2.1 Determine Resource Available	1				1	1	1
2.1.2.2 Post Eltrnc O of B Battle Map		2					1
3.1.2.2 Determine Resource Capability		1				2	
2.1.2.6 Maintain Templating Files				1	1		1
3.1.2.3 Identify Other Sources	1					1	
3.1.1.2 Determine Indicators				1			
3.1.1.4 Review Collection Plan File							

Table 19 (Item 17)

Task	NA	1	2	3	4	5	6
2.1.2.3 Post Collateral Enemy O of B	2	5	3				1
2.1.2.1 Determine Source Reliability	2	5	2	1		1	2
2.1.2.5 Maint. Friendly Sit. Overlay		1			2	1	1
2.1.2.4 Maintain Intelligence Wrkbook		2		1		1	
3.1.2.1 Determine Resource Available			1			1	2
2.1.2.2 Post Eltrnc O of B Battle Map		2	1				
3.1.2.2 Determine Resource Capability			1				2
2.1.2.6 Maintain Templating Files		1	1	1			
3.1.2.3 Identify Other Sources	1					1	
3.1.1.2 Determine Indicators			1				
3.1.1.4 Review Collection Plan File			1				

Table 20 (Item 18)

Items 16, 17, and 18 compared three different METHODS for recording the outcomes of a task step, each rated on a scale from 1--Highly useful, to 6--Of little use. The methods in order of presentation are:

- A displayed menu of possible outcomes where one could check off those that occur.
- A fill-in-the-blank format for entering numerical values, dates, etc.
- Free format typing of notes.

Preferences appear biased toward the greater flexibility of free-form typing entries, and perhaps toward the smaller memory demands posed by using menu lists for selections. Some differences were discernible among tasks for these three items.

For task 2.1.2.3--(Post Collateral Enemy Order of Battle) all entry modes were rated as useful. For task 2.1.2.5--(Maintain Friendly Situation Overlay) none were rated as useful. For task 2.1.2.1--(Determine Source Reliability) there was no consensus. For task 3.1.2.1--(Determine Resource Availability) all entry modes were rated as of little use. The ratings do not appear to reflect discriminations between the different modes for recording task step outcomes, but rather the usefulness or lack of usefulness of recording step outcomes in any manner for the particular task.

3.5.4 Comments for Items on Individual Tasks

Appendix D contains transcriptions of the comments which participants appended to their ratings of task step descriptions. The transcriptions are presented in the sequence of task descriptions in the booklet, with comments for each task presented in the order of the items in the response form. While the comments are too numerous for easy summary, examples are provided for tasks rated by a number of participants.

For *task 2.1.2.1--(Determine Source Reliability)* comments were numerous because all participants used the task for practice. Examples of comments from thirteen participants are:

- Analyst experience, messages redundancy, situational continuity all enter into the making of reliability estimates for a particular message
- Checking source reliability is often superfluous if source is known.
- Source reliability is most important on spot-type reports which are almost always time critical.
- If there is not enough time, eliminate step 2 (determine specific value of source) of this task.
- Sometimes one must act on the information first, then complete processing.

- Your memory can be a substitute for a file.

For *task 2.1.2.2--(Post Electronic Order of Battle Map)* there were a number of suggestions for changing the given step sequences and the boundaries with other tasks. Other comments from three participants were:

- This task cannot be eliminated; would cause deterioration of all-source products.
- Manual methods for data storage/retrieval are very time-consuming and difficult.

For *task 2.1.2.3--(Post Collateral Enemy Order of Battle)* there were concerted suggestions from eleven participants about re-ordering the steps of the task as given in the descriptive materials:

- Steps should be re-ordered in terms of immediate need/interest.
- Steps as given are out of sequence.
- Considerations discussed for eliminating some task activities.
- Deferrability of this task depends on the data--no deferment if data are "event-generated".

For *task 2.1.2.4--(Maintain Intelligence Workbook)* comments in relation to various rating items from four participants included:

- Should be keyed against pre-set (IPB) patterns, doctrinal templates, etc.
- If there is no time, there is little need to process this task once the data are posted to EOB.
- Earlier step information is constantly necessary: Must be able to recognize patterns, and determine when data is obsolete.

For *task 2.1.2.5--(Maintain Friendly Situation Overlay)* comments from five participants included:

- Combining of enemy and friendly situation displays is desirable if practical; intelli-

gence information must be sanitized before posting to G-3 map.

- Boundary condition postings are non-deferrable.
- If situation changes too rapidly, commander is briefed from memory, and processing is deferred.

For *task 2.1.2.6--(Maintain Templating File)* comments from three participants included:

- Not readily deferrable, -other than doctrinal templates- others are more or less progressive.
- For good analysis one needs a base to work from; IPB is that base.
- Actual postings of templates is very time-consuming; event or decision theme codes are usually briefed...
- Many things are based on memory because it is too time consuming flipping through references to verify templates.
- Recall/retrieval is important.

3.5.5 Debriefing Comments

When all participants in a session had completed their response forms a debriefing discussion was held. Comments can be summarized as follows:

3.5.5.1 General reactions to session

A number of participants mentioned that they appreciated the chance to express their views and contribute to the solution of problems they perceived as real and important. With regard to being asked to judge the information needs of intelligence analysts, several observed that it is hard to pre-judge or predict what will be needed, even by oneself, without a tactical context. It becomes even harder to judge information needs for others, without knowing the individual's situation, level of task-knowledge, training, and experience, and so on.

3.5.5.2 *Reservations about Automated Systems*

A remark that occurred in one form or another in almost every debriefing session was: "What happens if the automated system breaks down?--Analysts must NOT become helpless in such situations." Techniques for backup in the form of machine redundancy and hardcopy outputs were mentioned. Other suggestions for system failure were to gear system inputs, outputs, and alternative procedures for minimum conflict with initiating manual fall-back procedures, and to minimize shock from operating in isolated situations with communications that are spotty or inoperative.

3.5.5.3 *Field Safes and Footlocker Materials*

Comments in several sessions were directed at the need for storage of reference materials. Extensive possibilities for automated information services were perceived here (some noted that sometimes six or seven safes or lockers full of reference materials may accompany a headquarters level intelligence unit). While most of this information is used infrequently, access to it can be crucial. There were reservations about automating such storage however. Admittedly, in manual operations there often is not enough time to find very much of the pertinent footlocker data that applies to the solution of an analytic problem. Nevertheless, some discussants could not see how such data could be stored efficiently or easily accessed in an automated system. Additional concerns focused on the user's need to browse through relevant areas and to accurately query the data base. The requirement for a user-oriented query language is clear.

3.5.5.4 *Intelligence Workbook*

For a number of participants some form of automated aid for the intelligence workbook functions seemed very desirable. The workbook can function in a number of ways in manual operations: as a repository for reminder notes; as a source of references to current summary data; to supply cross-references to display items, etc.

The impression from the comments was that the intelligence workbook is a main aid for supporting various aspects of analysts' memories in recalling details of recent events of significance, especially during conditions of high work-load.

3.5.5.5 *Message Formats*

A frequently repeated opinion was that message formats could and ought to be kept as simple as practical. Several participants gave examples of message elements they judged to be of more or less utility for most situations. In essence, some questioned the cost/effectiveness of retaining lower utility elements for most tactical intelligence purposes. Besides date/time group, source type, and sender ID as necessary items, there were varying opinions about the importance of message element types included in, for example, the "salute" reporting mnemonic (size, activity, location, unit, time, equipment). Some of the differences appeared to result from opinions about the relative importance of functions served by the information in messages, such as indications and warning, targeting, enemy situation, order of battle, planning, etc.

3.5.5.6 *Displays*

The discussion of displays had several themes. Two of these were retention and proper handling of time notation symbology, and reduction of visual clutter; themes which are interrelated to a degree. The flexibility, field-portability, and reliability of the manual displays using maps, acetate overlays, and grease pencils, also was pointed out repeatedly. Sometimes there were explicit remarks that such crucial advantages of the manual operations must not be sacrificed while trying to gain the desirable update ease and speed of computer-driven displays. The use of multiple acetate overlays to reduce clutter was mentioned as very valuable but cumbersome and time consuming. The use of different colored grease pencils for different reporting time slices also was mentioned as very effective. Both these techniques were pointed out as examples of desirable display capabilities that were probably easy to

achieve with computer displays while also offering rapid and easy update and archival display storage (history) capabilities. Several remarked that displays, like message formats, must be kept very simple to be usable.

3.6 Discussion of Implications

Results from the current research phase revealed some patterns in the opinions of intelligence analysts regarding how they process information and how an automated system might aid in the process. There were systematic patterns in the variable degrees of confidence with which the participants answered the questions about intelligence processing tasks. Participants were able to comment about the comparative usefulness and boundary appropriateness for task descriptions. They had systematic opinions about the eliminability, deferrability, demandingness, interdependence, and information prerequisites of tasks. They discriminated among the usefulness values of task checkoff and cueing aids for different tasks. They had focused concerns and reservations about aspects of automation for tactical intelligence processing. They discriminated between automation support for different types of information such as that presently stored in safes, footlockers, and workbooks or journals. They had clearly formulated opinions about simplification of message formats and tactical information displays. Such considerations provide initial indications about what query methods have potential as aids for intelligence analysts.

3.6.0.1 Study Design Results should be accepted only as preliminary, taking several factors into account. On the plus side, participants were experts on a variety of intelligence topics and shared their knowledge without hesitation. They were provided with specific task descriptions and rating items that should have minimized the effects of ambiguity on results. However, two factors of the research may have lead to rather conservative data. First of all, the participants had no introduction to the research or specific review before coming to the session. Even one evening of "boning up" would probably have tightened the pattern of results obtained.

Secondly, participants were not allowed to confer during the rating work and share ideas about the problems. This eliminated the possibility of deepening and refining a common frame of reference. Consequently, data reflect knowledgeable opinions where the likelihood of consensus was lower that it might have been under less controlled conditions. Perhaps, the spontaneity of the research situation helped to guarantee realistic results.

Despite the limitations just cited, perceptibly tight CLUSTERS, at or near opinion EXTREMES were obtained for one or more of the tasks for ratings on twelve of the eighteen items. The clusters were indicative of some consensus on discriminations between tasks with respect to preferences for ways to cope with task load, demandingness of various tasks, dependencies between task steps, and the use of automated aids for task results checkoff.

4. EVALUATION OF A FAMILIARIZATION/REFRESHER DISPLAY IN MIQSTURE

4.1 Introduction

The purpose of this (second) project for evaluation of MIQSTURE was to test a CRT display arrangement for its value in familiarizing and/or refreshing the user/operator with infrequently used but essential elements of the interaction language. In this arrangement, language elements entered by the user/operator in a familiar ("easy entry") format are transformed and immediately displayed in a less frequently used format comprising a more flexible data entry procedure. The intent in providing the familiarization/refresher display is to maintain an immediately useful level of familiarity for the user/operator for the more flexible but less used entry format.

4.2 Problem Background

The user/operator would interact with the proposed MIQSTURE system via a work station consisting of a TV-like CRT display, a standard typewriter keyboard, and groups or "pads" of function keys. User/operator actions may involve many different combinations of: single function-key actions: positioning of a movable cursor spot in the display followed by a function-key or keyboard action; typing in single characters or strings of characters; and so on. To accomplish one transaction step in an interactive dialog with the system, a combination of such actions is often necessary.

Such transaction steps in the user/operator-system dialog vary on two dimensions:

1. The overall frequency of occurrence of the step in dialog.
2. The variability of actions allowed or required in the step.

An example of a transaction step showing high frequency of occurrence and high uniformity of actions is the "EXECUTE" command in MIQSTURE. This step is performed without variation many times for many purposes during most interaction dialogs. At the other extreme, a class of interaction steps with low uniformity of actions and low

frequencies of occurrence are the query formulations used to search for statistically rare or unique topical combinations.

4.3 Problem Statement

Several considerations entered into framing the research problem:

- High-frequency, high uniformity transaction steps often involve easy initial learning and later skill maintenance.
- Low-frequency, low uniformity transaction steps often involve difficult initial learning as well as difficult later maintenance of familiarity.
- The difficulties in the low uniformity transaction steps are usually inherent in the steps themselves, and for the most part cannot be eliminated by resolving the transaction steps into simpler ones. Furthermore, the functions performed by the complex, infrequent transaction steps usually cannot be ignored or eliminated.
- The low frequency of use of the more complex interaction steps means less practice with them, resulting in lower levels of familiarity. The result is often slower performance and/or increased errors when the complex steps must be employed for the first time after a period of disuse.

A potentially successful interactive language design needs an approach for increasing exposure and practice on complex, infrequently used interaction steps. The present research focused on the possible value of a familiarization/refresher display arrangement, whereby the more demanding formats for language entry are displayed concurrently with the corresponding versions of less demanding formats actually being used in the transaction steps. The question is: can such an arrangement help refresh (improve) the user/operator's level of familiarity for immediate use of the less frequently needed formats?

4.4 A Research Approach

For the experiment, participants were required to enter query statements using two different formats. The less demanding form of entry was a type-in-the-blank format (see Figure 4-1), while the more demanding format consisted of an unaided free-key-in format (see Participant Orientation Booklet, Appendix F).

name (name) Jones, B_____	address (addr) 12345 Main ___	city (city) Encino_____	state (stat) Ca	zip (zipc) 91234	dept (dept) 099	years (yotj) 1_
12-AN	15-AN	10-A	2-A	5-M	3-M	4-M

Figure 4-1. Example of Type-In-The-Blank Format.

The project approach was in two phases:

1. Design and develop the MIQSTURE simulation capability and experimental materials.

2. Conduct experimental sessions with participants.

Method

The MIQSTURE simulation capability consists of an interactive program running on a PDP 11/70 computer under the UNIX operating system. Several small data bases were developed and studied for the experiment. These included an Army tactical intelligence message file, and a personnel records file containing names, departments, salaries, and other data about individual personnel. Junior college level participants used in the experiment found the contents of the personnel records file to be the most familiar to their experience, so that file was used for the experiment. Experimental materials developed included a MIQSTURE Experimenter's Guide (Appendix E) a Participant Orientation Booklet (Appendix F), and a test query set (Appendix G).

The experimental session for each participant consisted of seven steps (see Appendix E for details):

1. The greeting, which included introductions, informal verbal explanation of the purposes and nature of the experiment, and a brief tour of the computer facility.

2. The orientation, in which the participant read the printed orientation materials and filled in example queries in the booklet (Appendix F), and included a question and answer session to assure understanding of all points.

3. Practice, performed by all participants, in which the participant was introduced to the terminal and provided with hands-on practice and coaching, using two question items on slips of paper. The practice consisted first of formulating queries from the question slips and entering each query by typing in all characters (data values, element qualifiers, connectives) of the query string. Then the same queries were re-entered again, this time by typing only data values into designated blanks in the MIQSTURE fill-in display format which has built-in qualifiers and connectives (see Appendix F).

4. The control phase, performed by all participants, in which a standard sequence of five question slips was provided, one at a time. Each was formulated by the participant into a query and entered into the terminal via the fill-in display format.

5. The treatments phase, in which a fixed sequence of five (different) question slips was provided, and queries were entered via the fill-in format under one of three conditions for each of three treatment groups of participants:

   a. Same conditions as the preceding control phase, in which the interaction history window of the fill-in display (see Appendix H) was turned off.

   b. As each data value, element qualifier, and query connective was entered by the user/operator via the fill-in format, it was immediately regenerated and

displayed through the interaction history window, in the free-style key-in entry format.

c. The participant entered the query via the fill-in format, during which time the interaction history window remained blank until the participant took the EXECUTE action to cause the query to be used to search the data base. At that point, the entire query was displayed in the free-style key-in format in the interaction history window.

6. The criterion phase, again performed by all participants, in which a standard sequence of another five question slips was provided, one at a time, and formulated and entered via the free-style key-in format (see Appendix G for a listing of the questions).

7. The debriefing step, in which the participant was thanked and compensated for participation, and offered an opportunity to be briefed on the results at a later date.

4.5 Results

The data analysis consisted of an analysis of variance (anova) performed on participant performance times for all three performance steps of the experimental session sequence. Each performance time was recorded automatically in two parts:

1. The think time, defined as the interval between when the participant received a question slip and made the first query entry action at the terminal, and

2. the key-in time, defined as the interval between the first entry action and the EXECUTE action, which sends the finished query for processing.

In addition, a visual analysis of typographical errors was performed on the automatically recorded interaction protocols.

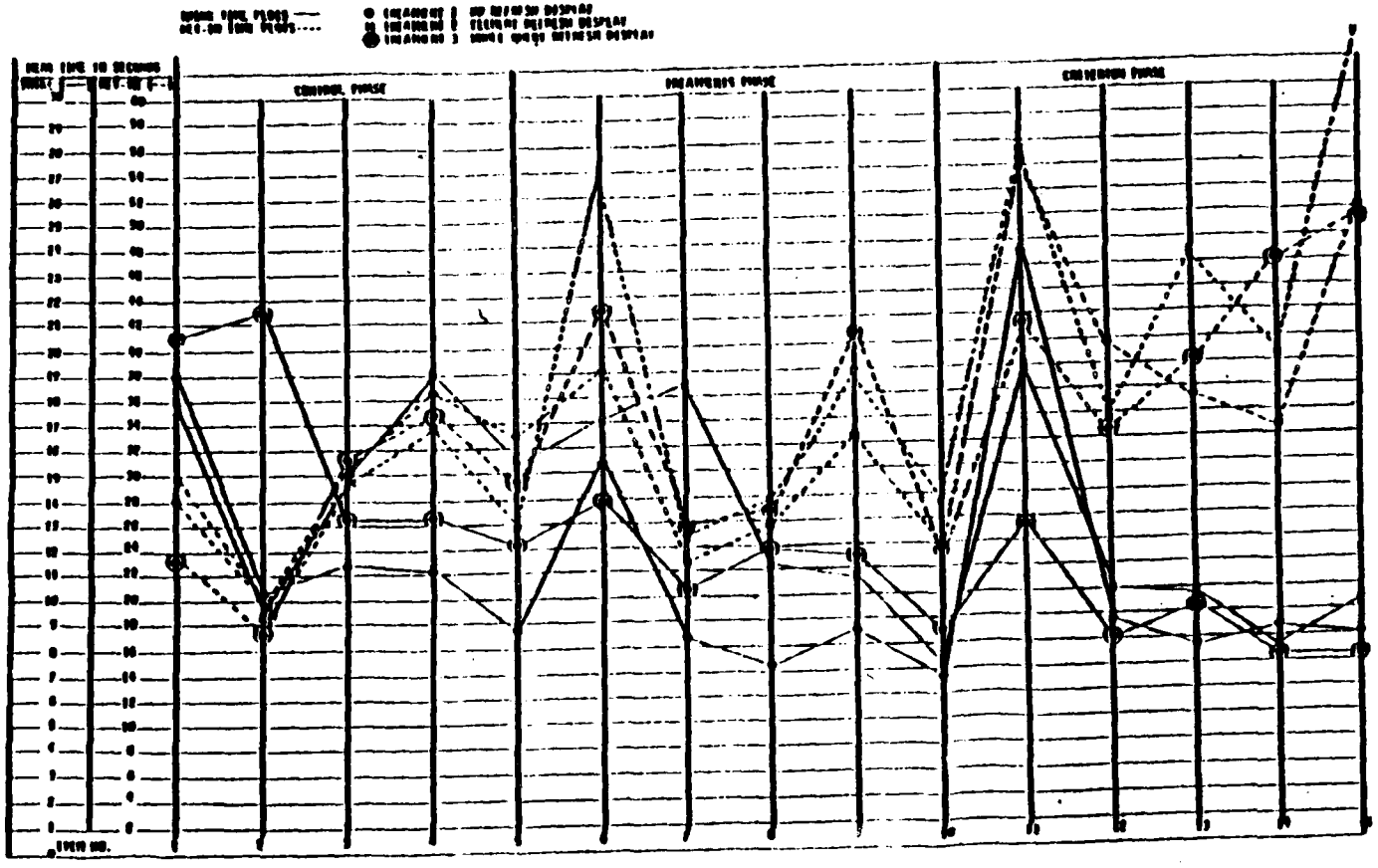


Figure 4-2 Think time and key-in time means

Figure 4-2 shows results of the experiment. The left-hand columns of the figure provide response-time scales in seconds for think times and key-in times. Names for the three phases of the experiment are arrayed across the top. Query numbers are indicated at the bottom of the column lines. Queries 1 through 5 comprise the control phase, 6 through 10 the treatments phase, and 11 through 15 the criterion phase. Each plot point represents the mean of values for the seven participants in a particular treatment. The treatment 1. (No refresh display) plot points are solid dots; treatment 2. (Element refresh display) points are Xs, and treatment 3. (Whole query refresh display) points are circled dots. Think-time points are connected by solid lines, key-in-time points by dashed lines.

Visual inspection of the plots of the three treatment groups in the control phase shows little scatter and a high correlation between key-in-time means (dashed lines) across items 1 through 5, and somewhat more scatter and lower correlation for think-time means (solid lines). An anova (21 cases) for the three treatment groups in the control phase showed no significant differences, indicating that the randomization of participants was successful, . Similarly, an anova for overall treatment group results for the criterion phase were also non-significant.

Although the overall treatment group differences for the criterion phase were not statistically significant, further inspection of the plotted data points provides some interesting trends:

1. There is a trend for reduced mean think times from left to right across the three treatments (an apparent learning effect); the overall difference between control and criterion phase think times is significant beyond the .01 level of confidence.

2. There is a trend for increased key-in times between the control and criterion phases, probably reflecting the increased keystrokes required in the free-key-in tasks of the criterion phase as compared to the fewer keystrokes required for the fill-in formats of the control and treatments phases. The overall difference

between the control and criterion phase key-in times is statistically highly significant (well beyond the .001 level of confidence). A corollary of this observation is that there were typographical errors in 7% of the control phase responses, 5% of the treatments phase responses, and 26% of the criterion phase responses. The overall difference in such errors between the combined control and treatments phases and the criterion phase is also significant well beyond the .001 level of confidence. This combined increase in errors and increase in key-in times represents a reliable difference in difficulty levels between the fill-in and free-key-in entry formats.

3. There is a suggestion of a "phase-change" effect of increased response times for both think and key-in for items 6 and 11, (the items introducing new treatments to the participants). This possible "distraction" effect for item 6 of the treatments phase appears most marked for the key-in times of the element refresh display treatment, next most marked for the whole query refresh display treatment, and least for the no refresh display treatment. The possible distraction effect appears quite marked between items 10 and 11 for both think and key-in times (item 10 being the last fill-in task, and item 11 the first free-key-in task for all participants).

4. While not significant, the differences in think-time means for item 11 are nevertheless in the expected (and desired) directions for the three experimental treatments. That is, the no refresh display (control) treatment shows the greatest increase in think time, the element refresh display treatment shows an intermediate increase, and the whole query refresh display shows the least increase in think time. This suggests that the whole query refresh display may have operated more strongly than the others to maintain the participant's unpracticed familiarity with the free-key-in format prior to item 11. However, it is also apparent that the familiarization effect, if reliable, was nevertheless largely

compensated by the single practice trial provided by item 11 itself, in view of the immediate reduction of the mean think times for items 12 through 15.

4.6 Discussion

The results clearly demonstrate the greater demand on users and the increase in errors due to free-key-in types of entry formats compared to fill-in types of formats. Of course, requirements for the increased flexibility afforded by the more demanding free-key-in format will vary, depending upon the particular tactical data processing application. For some of the applications requiring free-key-in, a significant proportion of the entries may nevertheless be amenable to the easier fill-in entry formats. If this proportion is high enough, the argument becomes strong for providing a dual-level entry format capability, such as the one available in MIQSTURE. For such applications (requiring a dual-level entry language) the problem of refamiliarizing the user/operator with the rarely used but crucially flexible free-key-in formats may be a serious one.

While statistically equivocal, the pattern of results nevertheless suggest a positive value for familiarize/refresh display types of arrangements in coping with use of free-key-in formats. Despite the limited sample of participants, the pattern of results obtained are consistent with expectations, and provide encouragement for pursuing this approach to interactive language display and utilization.

5. Conclusion

The current report provides designers of automated systems with preliminary information about selected ways to structure user-computer dialogues for tactical intelligence applications. In designing an interactive query language, both the importance of a task and characteristics of its components must be taken into account; cues and prompts are not equally helpful in all types of intelligence tasks for reminding users about correct input procedures. Overall, the research data provide insights for the designers of such languages and indicate that an interactive query language approach to tactical intelligence is quite promising.

6. APPENDICES

A-Task Description Booklet

B-MIQSTURE Interview Guide

C-Response Form Rating Distributions by Tasks

D-Transcription of Comments

E-MIQSTURE Experimenter's Guide

F-Participant Orientation Booklet

G-Test Questions Set

H-MIQSTURE Screen Image

2.0 ALL SOURCE PRODUCTION	
2.1 DATA BASE MANAGEMENT	
2.1.1 MAINTAIN INTELLIGENCE FILES	
2.1.2.1 DETERMINE SOURCE RELIABILITY 1. REVIEW REPORT TO DETERMINE THE SOURCE OF THE INTELLIGENCE INFORMATION. (E.G., UNIT, INDIVIDUAL, SENSOR, ETC). 2. CHECK THE SOURCE RELIABILITY FILE AND DETERMINE THE ALPHABETIC VALUE FOR THE SOURCE OF THE INTELLIGENCE REPORT AND ANNOTATE THE REPORT.	2.1.2.1 DETERMINE SOURCE RELIABILITY 1. CHECK REILIABILITY (A-F) AND ACCURACY (1-6) CODES FOR REPORT. IF NOT ASSIGNED, EXAMINE SOURCE DESIGNATION FORMAT ELEMENTS OF REPORT. 2. RETRIEVE SOURCE RELIABILITY DISPLAY FOR SOURCE DESIGNATION IN REPORT. 3. ASSIGN RELIABILITY AND ACCURACY ESTIMATES FOR SOURCE FROM SOURCE RELIABILITY FILE.
2.1.2.2 POST ELECTRONIC ENEMY ORDER OF BATTLE MAP EXTRACT FROM THE SIGNALS INTELLIGENCE REPORT AND POST TO EEOB MAP THE FOLLOWING DATA: A. EMITTER TYPE B. UNIT IDENTIFICATION OR LEVEL OF COMMAND C. LOCATION AND TIME D. TYPE WEAPON SYSTEM SIGINT REPORT EEOB MAP	2.1.2.2 POST ELECTRONIC ENEMY ORDER OF BATTLE MAP 1. ON DUAL SCREENS: a. REVIEW SIGINT REPORT FORMAT (4 ELEMENTS). b. REVIEW PROVISIONAL AUTOMATIC EEOB POSTING ENTRY (BLINKERED ON EEOB UPDATE/MAINTAIN DISPLAY). c. MAKE ADJUSTMENTS IF NECESSARY. d. RELEASE PROVISIONAL EEOB POSTING TO ACTIVE EEOB DISPLAY.

2.1.2.3 POST COLLATERAL ENEMY ORDER OF BATTLE

EXTRACT FROM THE INTELLIGENCE REPORT AND POST TO THE EOB MAP THE FOLLOWING DATA:

a. UNIT DESIGNATION AND IDENTIFICATION

b. LOCATION AND DISPOSITION

c. STRENGTH AND COMPOSITION

d. TIME AND EVENT

e. WEAPON SYSTEM

2.1.2.4 MAINTAIN INTELLIGENCE WORKBOOK

1. REVIEW EACH INTELLIGENCE REPORT FOR KEY INFO.

2. POST INFORMATION TO APPROPRIATE SECTION OF THE INTELLIGENCE WORKBOOK (EXAMPLES)

a.	INTEL	i.	MOVEMENT
b.	EW	j.	STRENGTH
c.	INF	k.	CAPABILITIES
d.	ARMOR	l.	VULNERABILITIES
e.	ARTY	m.	EQUIPMENT
f.	AD	n.	PERSONALITIES
g.	AIR	o.	CBR
h.	ENG	p.	CONCLUSIONS

3. UPDATE THE WORKBOOK AS MORE CURRENT DATA BECOMES AVAILABLE. DELETE OBSOLETE DATA.

INTELLIGENCE REPORT

EOB MAP

INTELLIGENCE WORKBOOK

2.1.2.3 POST COLLATORAL ENEMY ORDER OF BATTLE

a. FROM CRT DISPLAYED INTREP, USE TEXT-EDIT CAPABILITIES TO COPY-OUT, OR KEY-IN, 5 INFO ELEMENTS.

b. REVIEW EXTRACTED/KEYED ELEMENTS FOR CORRECTNESS.

c. CALL EOB UPDATE/MAINTAIN DISPLAY ON ADJOINING SCREEN.

d. USING EOB DISPLAY AND REPORT CURSORS AND "TRANSFER" BUTTON, POST 5 ELEMENTS TO EOB U/M DISPLAY, AND REVIEW.

e. TAKE "RELEASE" ACTION TO RELEASE PROVISIONAL POSITIONS TO ACTIVE EOB DISPLAY.

2.1.2.4 MAINTAIN INTELLIGENCE WORKBOOK

a. REVIEW CRT-DISPLAYED INTREP FOR KEY INFO.

b. FOR EACH KEY CATEGORY (A. THROUGH P.):

1. TEXT-EDIT EXTRACT OR KEY-IN REPORT DATA TO "HOLD" AREA ON REPORT DISPLAY CRT.

2. CALL APPROPRIATE AREA OF WORKBOOK FILE DISPLAY ON ADJOINING CRT DISPLAY.

3. USING CURSORS ON BOTH SCREENS, AND "TRANSFER" BUTTON TO POST THE WORKBOOK FILE.

4. TAKE "RELEASE" ACTION TO MOVE NEW POSTINGS TO ACTIVE WORKBOOD FILE.

2.1.2.5 MAINTAIN FRIENDLY SITUATION OVERLAY.

1. PERIODICALLY POST CURRENT FRIENDLY UNIT DISPOSITIONS, AS CARRIED ON THE G3 SITMAP, ONTO AN OVERLAY FOR USE BY ALL ELEMENTS OF THE EWIOC.

2. REVIEW INTELLIGENCE/EW REPORTS FOR DISPOSITION OF ASSETS AND POST TO FRENSIT OVERLAY.

2.1.2.6 MAINTAIN TEMPLATING FILES

ESTABLISH AND MAINTAIN TEMPLATING FILES CONSISTING OF:

a. DOCTRINAL TEMPLATES
b. SITUATION TEMPLATES
c. EVENT TEMPLATES
d. DECISION TEMPLATES

GS SITMAP

INTEL/EW REPORTS

FRIENDLY SITUATION OVERLAY

DOCTRINAL TEMPLATE FILE

SITUATION TEMPLATE FILE

EVENT TEMPLATE FILE

DECISION TEMPLATE FILE

TEMPLATING FILES

2.1.2.5 MAINTAIN FRIENDLY SITUATION OVERLAY.

1. G3 FRENSIT OVERLAY IS AUTOMATICALLY AVAILABLE TO ALL EWIOC SITUATION DISPLAYS.

2. (STEPS ARE ANALOGOUS TO THOSE FOR 2.1.2.3).

2.1.2.6 MAINTAIN TEMPLATING FILES

FOR EACH TEMPLATE TYPE, PERFORM PROVISIONAL MODIFICATION WORKUP:

a. ON CONTINUING BASIS, ASSIGN TEMPORARY CROSS REFERENCE LINKS BETWEEN INCOMING REPORT NO. AND EXISTING TEMPLATE NOS. FOR THE PRESCRIBED PERIOD OF A MODIFICATION WORKUP CYCLE, INPUT PHASE.

b. AT CLOSE OF INPUT PHASE FOR EACH X-REFERED TEMPLATE, REVIEW ALL REPORTS Z-REFERENCED TO THAT TEMPLATE (ON CRT).

c. ADJUST TEMPLATE IN LIGHT OF RELEVANT INFO. IN REPORTS.

d. ADJUST TEMPORARY X-REFERENCES TO MATCH WORKUP DECISIONS.

e. RELEASE ADJUSTED TEMPLATE AND ADJUSTED X-REFERENCED TO WORKUP REVIEW PROCESS.

3.1.1.4	REVIEW THE COLLECTION PLANNING FILE. REPORTING SOP AND G2/G3 REPORTING GUIDANCE FOR EACH ITEM OF SPECIFIC INFORMATION TO DETERMINE: a. REPORTING CRITERIA b. INTENDED RECIPIENT c. REPORTING FREQUENCY COLLECTION PLANNING FILE EEI/OIR FILE REPORTING SOP G2/G3 REPORTING GUIDANCE REPORTING REQUIREMENTS COLLECTION PLANNING FILE	3.1.1.4	REVIEW COLLECTION PLANNING FILE. 1. CALL UP AND SCROLL THROUGH SPECIFIC INFORMATION ITEMS LIST. FOR EACH ITEM, CONSULT REPORTING SOP (DOCUMENT), AND G2/G3 REPORTING GUIDANCE (SEARCHABLE/ SCROLLABLE FILE ON ADJACENT CRT). 2. KEY-IN OR USE "COPY-OVER" ACTION TO ANNOTATE EACH SPECIFIC INFORMATION ITEM WITH: a. REPORTING CRITERIA b. INTENDED RECIPIENT c. REPORTING FREQUENCY 3. REVIEW FOR CORRECTNESS, AND TAKE "RELEASE" ACTION TO ACTIVE EEI/OIR FILE.

3.0 INTELLIGENCE COLLECTION MANAGEMENT

3.1 INTELLIGENCE COLLECTION PLANNING

3.1.2 DETERMINE RESOURCE AVAIL/CAP

3.1.2.1 DETERMINE RESOURCE AVAILABILITY

1. DETERMINE THE RESOURCE ALLOCATION LIST AND DETERMINE THE AVAILABILITY OF COLLECTION RESOURCES TO MEET THE REQUIRED COLLECTION TASKS.

2. CHECK THE EQUIPMENT STATUS REPORTS AND DETERMINE THE OPERATIONAL STATUS OF THE ALLOCATED RESOURCES.

3. COMPILE A LISTING OF AVAILABLE RESOURCES TO SUPPORT THE INTELLIGENCE COLLECTION TASKS.

COLLECTION PLANNING FILE

RESOURCE ALLOCATION LIST

EQUIPMENT STATUS REPORTS

RESOURCE AVAILABILITY LIST

COLLECTION PLANNING FILES

3.1.2.1 DETERMINE RESOURCE AVAIL/CAP

1. CALL UP MASTER RESOURCE ALLOCATION DISPLAY, SKIP/SCROLL TO RESOURCES AVAILABLE FOR REQUIRED COLLECTION TASKS. EXAMINE CURRENT OPERATIONAL STATUS INFORMATION ASSOCIATED WITH EACH RESOURCE. FOR EACH RESOURCE THAT MEETS JOINT ALLOCATION/OPERATIONAL READINESS AVAILABILITY, TAKE "COPYOVER" ACTION TO COLLECTION PLANNING LIST ON ADJACENT CRT SCREEN.

2. REVIEW PLANNING LIST AND RELEASE TO WORK-IN-PROGRESS HOLD FILE.

3.1.2.2 DETERMINE RESOURCE CAPABILITY

1. REVIEW THE COLLECTION PLANNING FILES AND DETERMINE THE CAPABILITY OF THE AVAILABLE RESOURCES TO SATISFY THE COLLECTION TASKS.

2. DEVELOP A LISTING OF RESOURCES WHICH ARE AVAILABLE AND CAPABLE OF FULFILLING SPECIFIC EEI/OIR INFORMATION NEEDS.

COLLECTION PLANNING FILE

EEI/OIR

RESOURCE AVAILABILITY LIST

RESOURCE AVAIL/CAP LIST

COLLECTION PLANNING FILE

NOTE: RESOURCE CAPABILITY LIST IS PROVIDED BY THE COLLECTION OPERATING ELEMENT TO THE MISSION MANAGEMENT ELEMENT.

3.1.2.2 DETERMINE RESOURCE CAPABILITY

1. PLACE REVIEWED RESOURCE PLANNING LIST FILE ON ONE CRT, PLACE SPECIFIC INFORMATION ITEMS LIST ON ADJACENT CRT.
2. SCROLL THRU INFO ITEMS LIST. FOR EACH ITEM:
3. SCROLL THRU RESOURCE PLANNING LIST. FOR EACH RESOURCE, ASSIGN ONE OF 3 VALUES FOR USE TO COLLECT INFO ITEM:
   a. PREFERRED
   b. POSSIBLE
   c. LAST RESORT
4. WHEN FINISHED WITH ALL INFO. ITEMS, RELEASE RATED ITEM LIST TO MISSION WORK FILE.
5. RESULTS ARE INVERTED AND WRITTEN TO MWF ORGANIZED BY:
   a. COLLECTION RESOURCE
   b. PRIORITY OF SPECIFIC INFO. ITEM
6. ADJUST MWF USING TEXT-EDIT ELIMINATING DUPLICATES BY RUNNING AUTOMATIC DUPLICATE CHECK WHICH HIGHLIGHTS ITEM APPEARING UNDER MORE THAN ONE RESOURCE.
7. REVIEW FOR CORRECTNESS, RELEASE TO MISSION PREP SECTOR OF EEI/OIR FILE.

3.1.2.3 IDENTIFY OTHER SOURCES 1. REVIEW THE EEI/OIR FILE AND IDENTIFY THE SPECIFIC INFORMATION REQUIREMENTS WHICH CANNOT BE MET BY CEWI GROUP RESOURCES. 2. REVIEW THE CAPABILITY OF OTHER SOURCES TO FULFILL THE SPECIFIC INFORMATION REQUIREMENTS. 3. DEVELOP A LIST OF THOSE OTHER SOURCES AND PUT IT IN THE COLLECTION PLANNING FILE a. DIVISIONS AND SEPARATE BRIGADES AND REGIMENT. b. OTHER CORPS RESOURCES c. ADJACENT CORPS RESOURCES d. ECHELON ABOVE CORPS, INTER SERVICE AND ALLIED NATION RESOURCES. e. NATIONAL AND STRATEGIC RESOURCES	3.1.2.3 IDENTIFY OTHER SOURCES (ANALOGOUS TO STEP 1 OF 3.1.2.1)

3.0 INTELLIGENCE COLLECTION MANAGEMENT

3.1 INTELLIGENCE COLLECTION PLANNING

3.1.1 RECEIVE AND ANALYZE REQUIREMENTS

3.1.1.1 MAINTAIN EEI/OIR FILES

1. REVIEW THE COMMANDER'S STATED ESSENTIAL ELEMENTS OF INFORMATION (EEI) AND OTHER INTELLIGENCE REQUIREMENTS (OIR).

2. PRIORITIZE THE OIR IN ACCORDANCE WITH G2 COLLECTION GUIDANCE (THE EEI ARE ENTERED IN STATED PRIORITY ORDER) AND PLACE IN THE EEI/OIR FILE.

3. UPDATE THE EEI/OIR FILES UPON:

   a. FULFILLMENT OF SPECIFIC EEI/OIR.
   b. RECEIPT OF NEW EEI AND/OR OIR.
   c. CANCELATION OF A PARTICULAR OPLAN OR OIR REQUEST.

4. CHECK FOR AND CROSS REFERENCE DUPLICATE ENTRIES TO ELIMINATE DUPLICATE TASKING AND PROCESSING AND ADD TO THE EEI/OIR FILE.

COMMANDER'S STATED EEI

OTHER INTELLIGENCE REQUIREMENTS

G2 COLLECTION GUIDANCE

OPLAN/FRAG. ORDER

FULFILLED EEI/OIR (ASP)

EEI/OIR FILE

COLLECTION PLANNING FILE

3.1.1.1 MAINTAIN EEI/OIR FILES

1. (AS STATED AT LEFT)
2. (AS STATED AT LEFT), PLACE IN EEI/IOR FILE BY KEYING INTO DIGITAL DATA SYSTEM.
3. UPDATE ACTIONS A, B, C, (LEFT) EACH INVOLVE:
   - o DISPLAY FILE CONTENTS VIA CRT OR LINE/PRINTER OUTPUT, REVIEW.
   - o DISPLAY UPDATE VERSION OF FILE ON CRT, USE TEXT EDIT CAPABILITIES TO FIND, ADD, CHANGE, DELETE ITEMS.
   - o REVIEW FOR CORRECTNESS
   - O RELEASE UPDATE FILE TO ACTIVE STATUS VIA BUTTON ACTION.
4. "SEE ALSO" NOTES ARE ADDED & DELETED AS VIA 3 ABOVE.

3.1.1.2 DETERMINE INDICATORS

1. REVIEW THE EEI/OIR AND THE ESTIMATED ENEMY SITUATION TO SELECT THE APPROPRIATE EVENT ANALYSIS MATRICES. IF NO EVENT ANALYSIS MATRIX IS AVAILABLE FOR A PARTICULAR EEI/OIR REQUEST ASP DEVELOP THE REQUIRED MATRIX.

2. EXAMINE THE EVENT ANALYSIS MATRICES TO DETERMINE THE INDICATORS FOR EACH EEI/OIR.

3. ADD PRIORITY ASSOCIATED WITH EACH EEI/OIR TO ITS INDICATORS.

4. CHECK FOR AND CROSS-REFERENCE DUPLICATE ENTRIES TO ELIMINATE DUPLICATE TASKING AND PROCESSING AND ADD INDICATORS TO THE EEI/OIR FILE.

[COLLECTION PLANNING FILE]
[EEI/OIR FILE]
[ESTIMATED ENEMY SITUATION]
[TEMPLATING FILES]
[EVENT ANALYSIS MATRICES]
[EVENT ANALYSIS MATRIX REQ]
[EEI/OIR FILE]
[COLLECTION PLANNING FILE]

3.1.1.2 DETERMINE INDICATORS

1. CALL HARDCOPY PRINT OF ESTIMATED ENEMY SITUATION AND SCROLLABLE CRT MAINTENANCE DISPLAY OF EEI/OIR IN CONTEXT OF EES, AND:

   a. SCROLL THROUGH EVENT ANALYSIS MATRIX CATALOG DISPLAY ON ADJOINING SCREEN, SELECT RELEVANT MATRICES.

   b. FROM EACH SELECTED MATRIX, IDENTIFY APPROPRIATE INDICATORS.

   c. FOR EACH APPROPRIATE INDICATOR, USE CUSORS ON BOTH SCREENS AND "COPY OUT" BUTTON TO APPEND TO EEI/OIR ENTRY. WHEN FINISHED, SIGNAL.

   d. SYSTEM AUTOMATICALLY ORDERS INDICATOR BY ASSOCIATED EEI/OIR PRIORITIES, AND BUILDS INDICATORS LIST IN EEI/OIR FILE.

3.1.1.3 DETERMINE SPECIFIC INFORMATION 1. BREAK EACH EEI/OIR INDICATOR INTO SPECIFIC INFORMATION AND: a. KEY SPECIFIC INFORMATION DERIVED TO THIS APPROPRIATE INDICATOR. b. ASSIGN THE PRIORITY OF THE ASSOCIATED INDICATOR TO THE SPECIFIC INFORMATION. 2. CHECK FOR AND CROSS REFERENCE DUPLICATE ENTRIES TO ELIMINATE DUPLICATE TASKING AND PROCESSING. 3. ADD SPECIFIC INFORMATION TO THE EEI/OIR FILE. THE SPECIFIC INFORMATION WILL FORM THE BASIS FOR SPECIFIC ORDERS AND REQUESTS. COLLECTION PLANNING FILE EEI/OIR FILE	3.1.1.3 DETERMINE SPECIFIC INFORMATION 1. CALL SCROLLABLE INDICATOR LIST ON ONE CRT, AND SEARCHABLE/SCROLLABLE COLLECTION PLANNING, FILE ON ADJACENT CRT. SCROLL THROUGH EACH INDICATOR. FOR EACH INDICATOR: a. LOCATE SPECIFIC INFO ITEM IN COLLECTION PLANNING FILE "COPY OVER" TO APPEND TO INDICATOR, OR KEY-IN SPECIFIC INFO DESCRIPTION TO INDICATOR. b. WHEN FINISHED WITH ALL INDICATORS, REVIEW FOR DUPLICATES, AND RELEASE UPDATE/MAINTAIN VERSION OF INDICATOR LIST TO ACTIVE FILE STATUS. 2. SPECIFIC INFORMATION IS ADDED AUTOMATICALLY TO EEI/OIR FILE.

B-MIQSTURE Interview Guide

This interview concerns how you process tactical intelligence. We're going to show you selected task step descriptions which probably are familiar to you. We'd like to ask you questions about these steps, to help us develop an automated system that would aid intelligence processing. Four areas of aiding are considered: (1) cueing and prompting of a task step, (2) recording the outcome of a task step, (3) handling intermediate data results from a task step, and, (4) carrying data over between task steps.

The separate pamphlet that you have displays descriptions of tasks performed during tactical intelligence processing. The left half of each page describes steps in current versions of tasks selected and adapted from the CEWIOCAFAS document. The right half of each page describes steps in computer aided versions of the same tasks.

We wish to get your opinions about several aspects of these descriptions of tasks. First let's concentrate on current versions of the tasks; but we're also interested in your comments about the automated support versions. For a given task step, only some of the questions in this interview guide may be appropriate.

Your expert opinion as an intelligence analyst is very important to this project. The purpose is to incorporate your experience in ideas for an automated system. We'd like to remind you that your answers to our questions are intended only for use in this research.

Task step being considered is:_____

Assume the performer of the task understands the task step described and its activities, has been trained on them, but may be "rusty", tired, distracted, or badly overloaded. For this task step, how useful is the description AS GIVEN for reminding the performer about the details of the what, why, when, and where of activities to be performed in this step?

(1.) How useful is this task step description for cueing and prompting the performer about what to do?

1	2	3	4	5	6
Extremely Useful					Of little use

(2.) Please comment on the LEVEL OF DESCRIPTION of the task step.

1	2	3	4	5	6
Too General					Too Detailed

(3.) Are the task step BOUNDARIES (beginning, end) correct in relation to the other task steps surrounding it?

1	2	3	4	5	6
Many activities in this step should be put in other steps.		Task Boundaries O. K.			Many activities in other steps should be put in this step.

Comments:

Task step being considered is_____

(4.) Can the activities of this step be eliminated if neccessary?

1 2 3 4 5 6

Always Sometimes Never

If sometimes, under what conditions?

(5.) Is this step concerned with non-deferrable actions, (i.e., with processing crucial, perishable data)?

1 2 3 4 5 6

Always Sometimes Never

If sometimes, under what conditions?

(6.) Can the activities of this step be shortened or degraded if neccessary?

1 2 3 4 5 6

Always Sometimes Never

If sometimes, under what conditions?

Comments:

Task step being considered is:_____

(7.) How demanding is this task step in requiring your time and thought?

1	2	3	4	5	6
Extremely Demanding					Extremely Un-demanding

(8.) In this step, the number of different items needing more or less simultaneous attention is:

1	2	3	4	5	6
Very Large					Very Small

(9.) In this step, the number of items that must be recalled BY MEMORY is:

1	2	3	4	5	6
Very Large					Very Small

Comments:

Task step being considered is:_____

(10.) Is this step dependent on the completion of other steps?

Describe prerequisite step(s). | Why is it prerequisite?

In the above question we asked about prerequisite steps. We are also interested in requirements of the present step for DATA generated in earlier steps. With respect to the task step under consideration, data from EARLIER steps in this task may or may not be useful or neccessary in completing the present step.

(11.) How OFTEN are such earlier-developed data NECCESSARY to the present step?

1 2 3 4 5 6

Always Sometimes Never

If appropriate, describe data and conditions:

(12.) How EASY is it to identify the kinds of data needed from earlier steps?

1 2 3 4 5 6

Very easy Very difficult

If appropriate, discuss:

(13.) How READILY ACCESSIBLE are the needed data from earlier steps (e.g., in sit-maps, message files, your memory, etc.)?

1 2 3 4 5 6

Readily accessible Inaccessible

If appropriate, discuss:

Task step being considered is:_____

In a computer-automated support system for data processing, it is possible to provide means for "checking off" each step in a task as it is accomplished and to keep a record of the outcome of that step. Such a capability is more useful for some task steps than for others and useful for different reasons.

For the task step presently under consideration, how useful would such capabilities be:

(14.) For the TASK PERFORMER DURING PERFORMANCE OF OTHER TASK STEPS, to help in remembering the step as accomplished, deferred, deleted, short-cut, etc.:

1 2 3 4 5 6

Highly Useful Of little use

(15.) For the TASK PERFORMER, for LATER review and critique of OWN performance:

1 2 3 4 5 6

Highly Useful Of little use

Comments:

Task step being considered is:_____

For the task step under consideration, how useful would it be to have the following different means of recording the outcomes of the step?

(16.) In order to store a future reminder to you of outcomes resulting from this step, would you find it useful to have a displayed list of possible outcomes, where you could check off ones that occur?

1 2 3 4 5 6

Highly useful Of little use

(17.) For the same purpose as above, how useful would a fill-in-the-blank format be (for entering numerical values, dates, etc.)?

1 2 3 4 5 6

Highly useful Of little use

(18.) For commenting about outcomes of this step, how useful would it be to be able to store your own typed notes for future reference?

1 2 3 4 5 6

Highly useful Of little use

Comments:

All Tasks Totaled

USERS RESPONDING: 13

	NA	1	2	3	4	5	6
FAMILIARITY RANK	0	13	13	11	3	2	
ITEM 1		11	14	10	1	7	7
ITEM 2		6	4	27	10		3
ITEM 3	5	5	1	23	11	3	2
ITEM 4	3		4	10	2	11	20
ITEM 5	4	15	13	5	5	0	
ITEM 6	3	1	5	19	5	0	9
ITEM 7	3	9	13	6	6	11	3
ITEM 8	3	10	9	9	0	0	3
ITEM 9	4	11	7	11	5	0	4
ITEM 10	9	Y=30			N=11		
ITEM 11	7	11	13	6	3	4	6
ITEM 12	14	7	13	7	3	3	3
ITEM 13	11	5	8	5	10	0	3
ITEM 14	0	4	11	11	4	6	6
ITEM 15	6	5	4	7	5	9	14
ITEM 16	7	7	10	7	3	5	11
ITEM 17	4	7	8	5	2	11	13
ITEM 18	5	16	11	3	2	5	8

2.1.2.3 Post Collateral Enemy Order of Battle

USERS RESPONDING: 11

	NA	1	2	3	4	5	6
FAMILIARITY RANK		9	2				
ITEM 1		6	2	1		2	
ITEM 2				7	4		
ITEM 3		2		8	1		
ITEM 4	1		1	1		1	7
ITEM 5	1	5	4	1			
ITEM 6	1		1	4		3	2
ITEM 7	1	2	5	1	1	1	
ITEM 8	1	3	3	2	1	1	
ITEM 9	1	4		4		1	1
ITEM 10	1	Y=10			N=0		
ITEM 11	1	3	2	1		2	2
ITEM 12	4	2	3	1			1
ITEM 13	3	3	1	2	1	1	
ITEM 14	1	1	1	4	2		2
ITEM 15	1	2		2		2	4
ITEM 16	2	2	2	3		1	1
ITEM 17	2	2	3	2			2
ITEM 18	2	5	3				1

2.1.2.1 Determine Source Reliability

USERS RESPONDING: 13

	NA	1	2	3	4	5	6
FAMILIARITY RANK	8	1	2	1		1	
ITEM 1		1	2	6		1	3
ITEM 2		1	2	6	3		1
ITEM 3	1	2		6	3	1	
ITEM 4			2	7	1	3	
ITEM 5	1	1	5	1	1	4	
ITEM 6		1	1	6	1	3	1
ITEM 7	1	2			3	4	3
ITEM 8	1		2	1	3	3	3
ITEM 9	1	3	1	2		4	2
ITEM 10	1	Y=8			N=4		
ITEM 11	3	3	4	1	1		1
ITEM 12	3	3	3	2	1		1
ITEM 13	3		3	1	2	3	1
ITEM 14	2	1	5	1	1	2	1
ITEM 15	2	1	1	3	1	2	3
ITEM 16	1	3	4		2	1	2
ITEM 17		1	4	1		4	3
ITEM 18	2	5	2	1		1	2

2.1.2.5 Maintain Friendly Situation Overlay

USERS RESPONDING: 5

	NA	1	2	3	4	5	6
FAMILIARITY RANK			2	3			
ITEM 1		2		1	1	1	
ITEM 2		1	1	2	1		
ITEM 3				3	1	1	
ITEM 4				2		1	2
ITEM 5		2	1		1	1	
ITEM 6			1	2		1	1
ITEM 7				1	1	3	
ITEM 8			1		2	2	
ITEM 9			1		3	1	
ITEM 10		Y=3			N=2		
ITEM 11		1	2		1		1
ITEM 12	2		2			1	
ITEM 13	1	1	2			1	
ITEM 14	1		1	1	1		1
ITEM 15		1	1	1		1	1
ITEM 16		1				1	3
ITEM 17			1			1	3
ITEM 18		1			2	1	1

2.1.2.4 Maintain Intelligence Workbook

USERS RESPONDING: 4

	NA	1	2	3	4	5	6
FAMILIARITY RANK		1	1		1	1	
ITEM 1			2	1			1
ITEM 2				3			1
ITEM 3	1			3			
ITEM 4			1			1	2
ITEM 5		1	1			2	
ITEM 6			1		1	1	1
ITEM 7		1	1	2			
ITEM 8		2		2			
ITEM 9	1	1		1		1	
ITEM 10	1	Y=1			N=2		
ITEM 11	1		1		1		1
ITEM 12	1		1		1	1	
ITEM 13		1	1	1	1		
ITEM 14		1		1		2	
ITEM 15					1	2	1
ITEM 16	1			1		1	1
ITEM 17		1				1	2
ITEM 18		2		1		1	

3.1.2.1 Determine Resource Availability

USERS RESPONDING: 4

	NA	1	2	3	4	5	6
FAMILIARITY RANK			2	1	1		
ITEM 1		1	1	1			1
ITEM 2		1	1	1	1		
ITEM 3	1	1			1		1
ITEM 4	1					1	2
ITEM 5	1		1	1	1		
ITEM 6			1	1			2
ITEM 7		1		1		2	
ITEM 8		1	1		1	1	
ITEM 9		1	1		1	1	
ITEM 10	2	Y=1			N=1		
ITEM 11		3				1	
ITEM 12	1	2	1				
ITEM 13	1				2		1
ITEM 14	1		1	1		1	
ITEM 15	1				1	1	1
ITEM 16	1				1	1	1
ITEM 17	1				1	1	1
ITEM 18			1			1	2

2.1.2.2 Post Electronic Enemy Order of Battle Map

USERS RESPONDING: 3

	NA	1	2	3	4	5	6
FAMILIARITY RANK		1	1	1			
ITEM 1		1	1			1	
ITEM 2				3			
ITEM 3				2		1	
ITEM 4						1	2
ITEM 5		3					
ITEM 6	1			1			1
ITEM 7		1	1	1			
ITEM 8			1	2			
ITEM 9			1	1			1
ITEM 10	1	Y=1			N=1		
ITEM 11			1	1			1
ITEM 12	1		1	1			
ITEM 13	1			1		1	
ITEM 14	1					1	1
ITEM 15			1			1	1
ITEM 16		1					2
ITEM 17		2					1
ITEM 18		2	1				

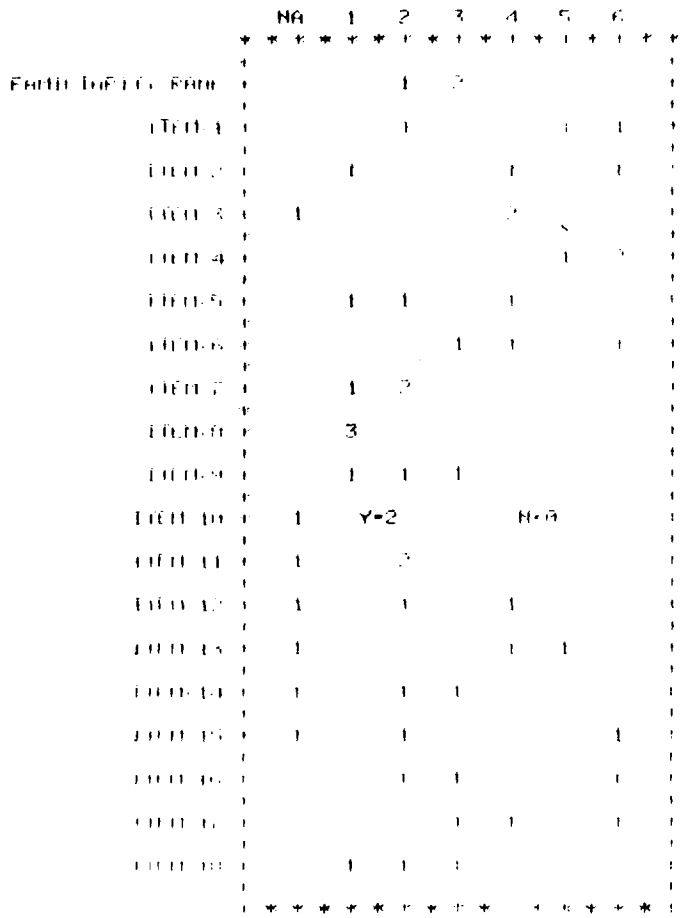
3.1.2.2 Determine Resource Capability

USERS RESPONDING: 3

	NA	1	2	3	4	5	6
FAMILIARITY RANK		1	1		1		
ITEM 1			2			1	
ITEM 2		1		2			
ITEM 3				1	1		1
ITEM 4						1	2
ITEM 5		1		1		1	
ITEM 6				3			
ITEM 7		1			1	1	
ITEM 8		1			1	1	
ITEM 9		1		1	1		
ITEM 10	1	Y=2			N=0		
ITEM 11		1	1	1			
ITEM 12			1	1		1	
ITEM 13			1		1		1
ITEM 14			1	1			1
ITEM 15				1	1		1
ITEM 16	1		1	1			
ITEM 17		1				2	
ITEM 18			1				2

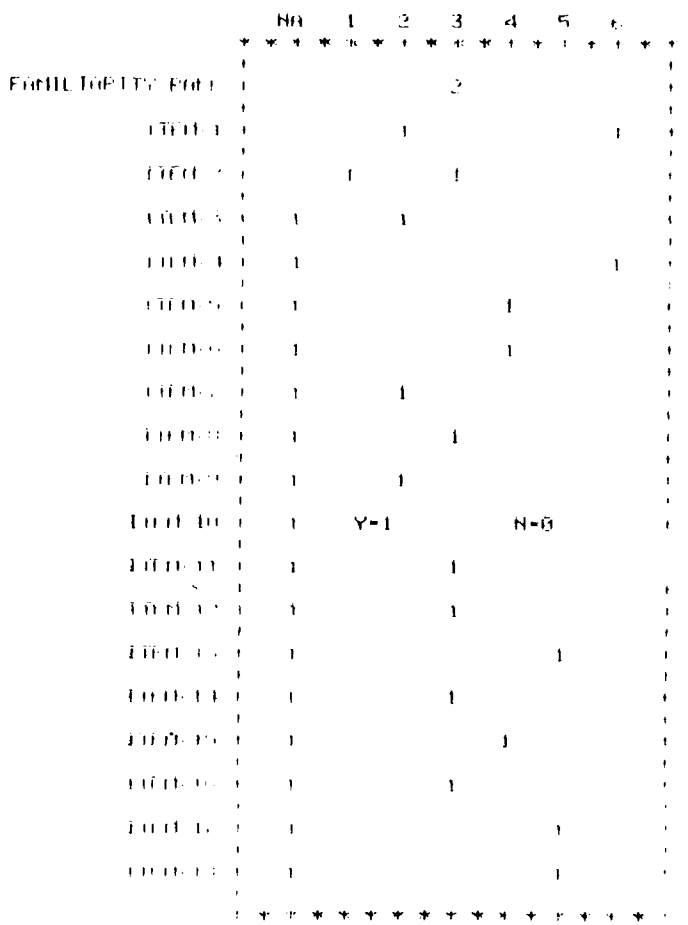
2.1.2.6 Maintain Templating Files

USERS RESPONDING: 3

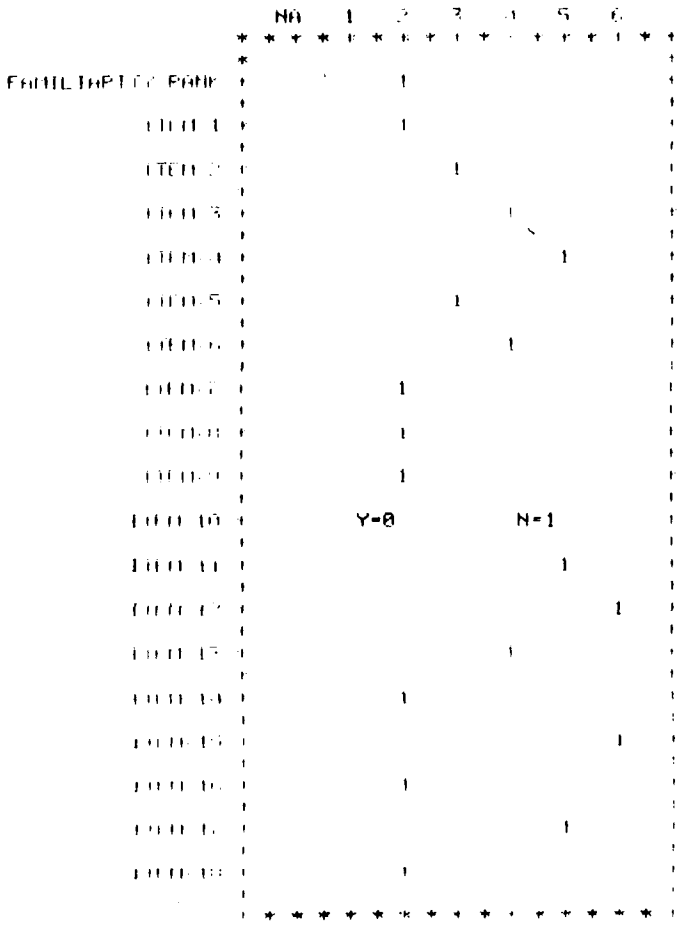


3.1.2.3 Identify Other Sources

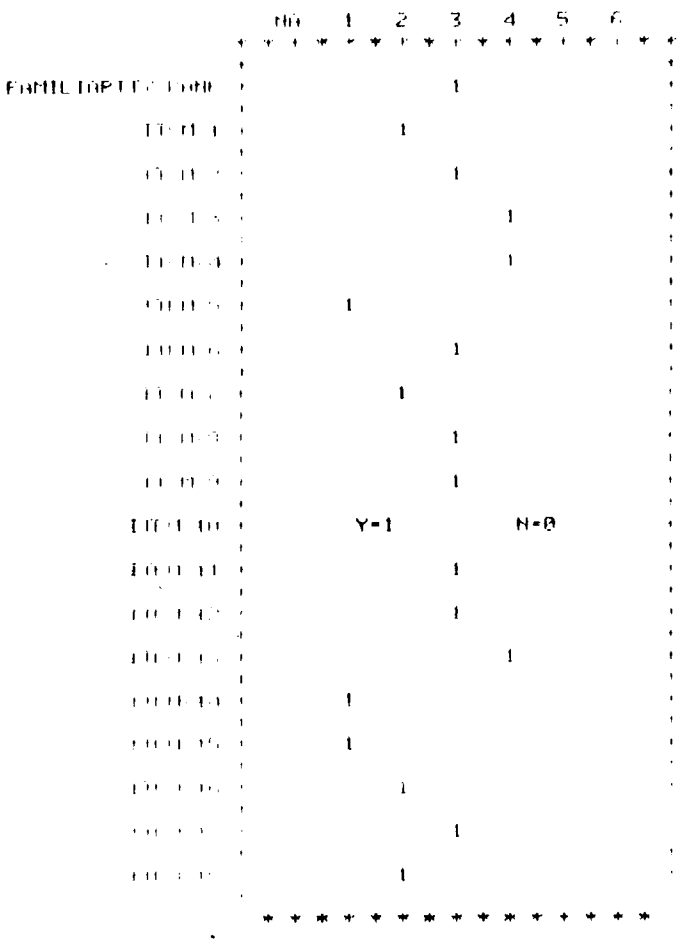
USERS RESPONDING: 2



3.1.1.2 Determine Indicators



3.1.1.4 Review Collection Planning File



2.1.2.1. DETERMINE SOURCE RELIABILITY

Q. (1.) Comments:

Check Black, White, Grey List for personality if new source.

Q. (2)

No mention of data validity/verification - source reliability is only half - other half relates to analysts belief that the information is likely to be correct (other indicators).

Q. (2)

Too much reading of an operator is already tried. Just one key word should be sufficient. i.e. reliability -------.

Q. (3.)

Considering that at least a minimum of training has been received this step is of little value to the TAC intelligence officer.

Q. (3.)

I have not seen source reliability files maintained.

Q. (3.)

"Reliability" is a very subjective judgement. An operator would not normally know the reliability of a particular source. He would have to be told by the expert on that particular system to get a reliability judgement of any value and even then I am not certain it could be described by an alpha-numeric.

The term (or criteria) "important/not important" may be easier to use than "reliable" due to the fact that no judgement, on the operator's part is called for. An operator must only record into the machine whether or not his boss told him that a particular report was important or not.

2.1.2.1. DETERMINE SOURCE RELIABILITY

Q. (3.)

Should be an integral part of all data entry, and as a reminder, tasks should be included as lst step in the others.

Q. (4.)

Additional information may negate the need to determine reliability.

Q. (4.)

If sufficient quantities of information are being received from varied sources, then receipt of the information from 2 or more sources will serve to prove its reliability.

Q. (4.)

Usually the source reliability is included in or appended to incoming message, unless the report is being originated by the using unit.

Q. (4.)

#2 Time: Do decide, do assign class (eg. A-1) may not allow, be ample - go on gut feeling.

Q. (4.)

There are certain instances in which it does not matter if a source is extremely reliable or not. In any case it will probably be recorded anyway.

Q. (4.)

Checking file often is superfluous, particularly if the source is commonly heard from.

2.1.2.1. DETERMINE SOURCE RELIABILITY

Q. (4.)

Reliability of source is very important.

Q. (4)

Only if source is unknown.

Q. (5.)

If using unit is originating a perishable report and needs to include a standard evaluation grade of that source (i.e. that source would receive the same evaluation from any agency which originated the report.

Q. (5.)

Perishable information is of more value to people who can shoot at it or interdict that target.

Q. (5.)

Sources are flexible.

(5.)

Source is most important on spot-report type reports which are almost always time critical.

Q. (6.) Comments:

Reliability determination is an important step in evaluation of information. Over a period of time, as analysts become more familiar with various sources, it becomes more and more of a mental process. Failure to properly evaluate source reliability, or take it into account can lead to faulty intelligence production and loss of creditability.

2.1.2.1. DETERMINE SOURCE RELIABILITY

Q. (6.)

Same as four. There are times when the information should be acted upon, at least as an intelligence indicator, and often times unnecessary delay may result in missing a key piece of data or opportunity.

Q. (6.)

Only if step one yields no information at all.

Q. (6.)

If using an incoming report which already includes this data.

Q. (6.)

Eliminate step 2 if not enough time.

Q. (7.)

Depends on the type of source being evaluated i.e. electronic versus humint.

Q. (9.)

If evaluating source informally and not by SOP or by an actual computation of his verification rate, it is necessary to recall entire history of source, his origin, the volume and level of his information, and his approximate "batting average" in particular areas of information. (i.e. a source may provide strong and reliable background but poor current intelligence because of his placement or access).

Q. (9.)

Item 7 step demanding in time not demanding in thought.

Q. (9.)

An operator would not normally have any idea of what is going on in an intelligence operations center. He should not have to remember anything.

2.1.2.1. DETERMINE SOURCE RELIABILITY

Q. (9.) Comments:

The operator, if given sole responsibility would have to have experince.

Reliability of Sources is a flexible thing. It is also based on near real time. Today it is good, tomorrow it is not.

The data base would have to be re-set daily - if not every 8 to 12 hours.

Q. (10.)

No.

Q. (11.)

Depending on source e.g., Humint - previous reliable reports would lend more credance to the source as reliable.

Q. (11.)

As above, it might be desirable to be working with a continuously updated source reliability. (May be too complex or misleading at tactical level, but on the other hand, might inject objectivity into system.

Q. (11.)

To build a reliability base, past reports must have been evaluated.

Q. (11.)

Comparison of data from sources or like sources is beneficial in determining reliability.

(11.)

Dependent on the "data-base" of available collectors and their reliability in the post, but this is generally kept in the heads of the operators, not written.

2.1.2.1. DETERMINE SOURCE RELIABILITY

Q. (11.)

Each item of data submitted by a source can be used to increase reliability of source designation - each confirming piece of information raises relative accuracy of the information.

Q. (12.)

Comparison of effects on source (electron) by weather for example would establish a trend.

Q. (12.)

If source provided intelligence test to see if it was subsequently proven, disproven or unknown.

Q. (12.)

Data is often unavailable to confirm or deny a report or prediction.

Q. (12.)

Reliability of sources is not a stagnate thing.

Q. (13.)

It is a judgement on the part of the analyst.

(13.)

Is virtually inaccessable unless the operator has prior experience with the collectors. In that case, he must rely on the assessment of other people.

Q. (13.)

Dependent upon type of information required.

2.1.2.1. DETERMINE SOURCE RELIABILITY

Q. (13.)

Certain sources will be closely monitored and all intelligence from them recorded. The difficulty will be in objectivity determining whether intelligence was later: proven, disproven, or indeterminate.

Q. (13.)

If date is very old it becomes 1) erased off a situation map, 2) lost in a clerk's journal causing much wasted time in trying to locate.

Q. (13.)

Volume of data under consideration and number of sources dealt with causes information/data to get lost in the manual shuffle or fuzzy in the memory.

(14.)

Helpful for those who have had little or no prior experience.

Q. (14.)

Of little use except as a data bank of related information.

(15.)

In a field environment, the "critique" of performance is winning the war. A critique is normally not necessary except in some excercises.

Q. (15.) Comments:

Once done, it is too late, must be accomplished as we go along.

Q. (15.)

The ability to recall messages for source and reliability could greatly aid the process of analysis and production and building intelligence data - OB, EOB, etc. - with relative reliability of systems (Humint, sigint, photint, etc.) over a short or long time.

2.1.2.1. DETERMINE SOURCE RELIABILITY

Q. (18.)

The whole process of evaluating sources and accuracy of information may not be as applicable in this scenario as might be imagined. If too much weight is attached to these codes, the information, no matter how valid, may be overlooked in analysis should it be assigned a lower than appropriate rating. Secondly, unlike the HUMINT field where one is dealing with sources which may have cause to distort the facts, generally the Tactical Intelligence field deals with sources that have no reason for misrepresentation. Notable exceptions are those items derived from Refugees and PW's and the like.

Q. (18.) Comments:

Recall of notes or interpretation is necessary but not often used because of reams of paper that must be dug through - memories are not always exact and seldom reliable in high stress situations.

Q. (18.)

Useful to use check-off format. Useful to somehow store outcome to update "batting average" as mentioned earlier.

Q. (18.)

"Fill in the blank" type data is really of little use in assisting in the determination of reliability.

P. (18.) Comments:

As a step in preparation for verification tasking under the unit collection plan.

2.1.2.2. POST ELECTRONIC ENEMY ORDER OF BATTLE MAP

Q. (3.) Comments:

I would change the sequence to key on the most important areas first:

A. LOC/TIME
B. Type WPN SYS.
C. Emitter type
D. Unit ID

Q. (3.) Comments:

1. At division level, given current capabilities, task should key on A. Emitter type (ELINT only), B. Location and time, activity reported, C. weapons system association, D. Unit ID or level of CMD. Note: Location function is extremely limited.

2. The development of EW order of battle holdings (data base) should be interfaced/ incorporated at this step.

Q. (7.)

It is either there or not.

Q. (9.)

Basically, you are concerned with types, capabilities, associated systems and what unit/echelon is the system normally located.

Q. (11.)

Collection data base, EOB holdings.

Q. (11.)

Determines trends i.e. the movement of an emitter from one local to another may signify an impending movement.

Q. (12.)

Movement, locations, durations, etc.

2.1.2.2. POST ELECTRONIC ENEMY ORDER OF BATTLE MAP

Q. (15.)

Useful in later review to assist in determing trends.

Q. (16.)

Cross reference/recall of specific gaps in data to request technical support.

Q. (17.)

Filing technical data related to report.

Q. (18.)

Analyst comments/ reports resulting from SIGINT OPNS/ time differentials/ collection management notes.

2.1.2.3. POST COLLATERAL ENEMY ORDER OF BATTLE

Q. (3.) Comments:

Rather than questions as posed --- ask:

Unit size _____

Unit type_____

Unit location_____

Unit designation_____

Unit activity_____

Special weapons?_____

Time located_____

Q. (3.) Comments:

(2) Might add "Source Evaluation".

Q. (3.)

A time designator would be needed. An operator should not be a button pusher but an Intelligence Analyzer.

A computer setup for Intelligence should be a data base - Time frames, Indicators, sources, etc. This system should have "recall", correlation made to assimilate past intelligence with present-future intelligence to assist the intelligence analyzer in his work.

Q. (3.) Comments:

Steps should be in order of immediate need/interest:

Time and Event
WPN system
Location and disposition
Unit ID
Strength

2.1.2.3. POST COLLATERAL ENEMY ORDER OF BATTLE (Cont.)

Question (3) Cont.

(3.) Comments:

SLB-Steps in this stop are out of sequence. Should be:

d. Time and Event
e. Weapon system
b. Location & Disposition
c. Strength & Composition
d. Unit ID

Q. (4.)

Given only 1 or 2 of the items of information called for, information would still be posted.

Q. (4.)

Elements of this procedure may have to be omitted for lack of information, however as much as possible must be completed.

Q. (4.)

Step E - Time constraints and certainly state of the art grease pencil and acetate would eliminate this from cluttering up the OB map - type of unit should key knowledgable person to weapons types.

Q. (5.)

If information is reliable and accurate enough for use as targeting data, it would be considered perishable. Time and event may be indicators of immiment action, ergo: perishable.

(5.)

Almost always, since they tend to be "event generated" (e.g. - a nuclear strike).

2.1.2.3. POST COLLATERAL ENEMY ORDER OF BATTLE

Q. (5.)

If intelligence source is providing highly perishable data user is usually (should always be) sufficiently adept in handling data to negate the requirement for this step.

Q. (5.)

At division level much of the data is old upon receipt.

Q. (6.)

Maps are generally posted with unit size, type and DTG of observation as a minimum, more information being nice to have but omitted for lack of tine or data.

Q. (6.) Comments:

This step/information is the meat and potatoes.

The amount of information received within a one hour period in a Corps Toc is around 100-200 msgs. (based on Reforger 78 figures). One operator could not keep up with this and information would become old before it is used.

Q. (6.)

For example unit Desig. and ID will generally give me the basic composition/ disposition. The number and type of events will guide you towards approximate strengths etc.

Q. (6.)

Items b, d, and either a or e are a minimum. If OB on that particular unit is already established, you would need only updated b and d and battle damage to unit, if any. Units size (a) and type of weapon system (e) would also determine if it would be posted on a division SITMAP. (i.e. DTOC would not normally post a plt or a single howitzer)

Q. (6.)

Steps C & E = time, map clutter, stress.

2.1.2.3. POST COLLATERAL ENEMY ORDER OF BATTLE

Q. (6)

See 4/5

Q. (6.)

Only if information is of a catastrophic nature ("flash" - initiation of hostilities, use of CBR weapons, paradrop in friendly rear areas, etc.).

(8.) Comments: Ref. g-

Even though references are available, the knowledge of order of battle must be available quickly, since intelligence is generally short fused. This is an area where automation could simplify and shorten the time needed to look up references.

Q. (9.) Comments:

Items recalled by memory include:

a. Previously located units, to detect movement may be more in "analysis" step than in plotting but is done while plotting in the field.

b. Previously identified units, to ID partially ID-ED or erroneously ID-ED units in incoming reports.

c. Template of en. doctrine to assist in ID-ing partially/erroneously ID-ED units by knowing what is likely to be there.

Q. (9.)

? Time/thought requirement increases as amount of information on map increases. Biggest difficulty is determining whether Bn now at point A is the same Bn previously reported at point B, and determining if that unit is still worth posting (i.e. what have they lost?)

Q. (9.)

The above questions are complicated by a fast moving, central European scenario where we can expect actions to be fast and furious.

2.1.2.3. POST COLLATERAL ENEMY ORDER OF BATTLE

Q. (9.) Comments:

Map symbols for units and weapons, OB designations after a time become "second nature" to analyst.

Q. (10.)

Apart from use against a pre-existant data base, no.

Q. (10.)

This step is complicated with a combination of other sources.

Q. (10.)

No IFF information is provided without requirement for local collection planning and tasking.

Q. (11)

Posting is in my opinion, an initial step because 1) If intelligence is hot, it is vital to graphically display it as soon as possible to see what it means and 2) To determine what further processing is necessary to expand on it.

Q. (11.)

Never necessary almost always useful.

Q. (11.)

All source analysis.

Q. If time is critical and/or redundant sources provide supporting data.

2.1.2.3. POST COLLATERAL ENEMY ORDER OF BATTLE

Q. (12.)

Previous location of subject unit should be a well defined term.

Q. (12.)

Again, how reliable.

Q. (13.)

OB generally is stored in a file (binder) requiring flipping of pages or dependance on memory (which may not be accurate under stress)

Q. (13.)

Strength figures are often harder to obtain, but are also least necessary.

Q. (13.)

If memory doesn't key you to some particular msg, it can be very time consuming to find data. SITMAP very helpful, but gets very cluttered.

Q. (13.)

Accessible but extremely time consuming.

(13.)

Order of battle maps are posted directly from the incoming reports.

Q. (14.)

I would hope that in this particular event the officer or OG technician will not need to be reminded.

Q. (14.)

Data can be annotated as posted/not posted, reported/not reported to highter/lower etc.

2.1.2.3. POST COLLATERAL ENEMY ORDER OF BATTLE

Q. (15.) Comments:

Gen. Of the data required, item "a" is most often missing. Should have some way of comparing data we do have and trying to match with existing unit in OB file. Task as stated ("extract & "post") is simple. Difficulty comes in comparing new data with old in "updating" map, rather than just continually posting all data.

Q. (15.) Comments:

Each component should be prompted and an UNKNOWN demanded if information unavailable to insure completeness.

On display only unit designation (symbol) and location need to be routinely displayed, other data can stand-down unless called up (light pen, etc.)

Q. (15.) Comments:

This is a very basic step with most "analysis" due to analyst experience and written guidelines. Once credibility is assigned a piece of information little need exists to verify/recall source reliability. Verification/recall of source for confirmation tasking/reporting is more important.

Q. (15.) Comments:

RAM for history of units, movements, etc.

Q. (15.) Comments:

Once reports are input, subsequent review is not really required.

Q. (15.) Comments:

This computer-auto-support system should store information/intelligence to allow instant re-call.

Q. (15.) Comments:

As a review I do not think many analysts are concerned with keeping score of their correct guesses. However, would be very useful in recouping for stats and briefs. It is always difficult to recall exactly what occurred six hours earlier in the battle.

2.1.2.3. POST COLLATERAL ENEMY ORDER OF BATTLE

Q. (18.) Comments:

Access to notes and messages under present system allow reconstruction of events only after the fact and with much deciphering and time, e.g. after an exercise.

Q. (18.)

Every OB technician has developed his own particular system and the ability to input my notes, comments etc. would be very useful.

Q. (18.)

Useful to store SITMAP as a whole at regular intervals.

Q. (18.)

Essential.

2.1.2.4. MAINTAIN INTELLIGENCE WORKBOOK

Q. (1.)

Primarily part 3 of the step add INTEL SIT MAP

Q. (3.) Comments:

Need to key to 2.1.2.6. so automatic check of doctrine is accomplished.
Doctrinal templates should also have key indicator list - i.e. activate.

Q. (3.) Comments:

To much too read - operator would not have time, with the amount of information comoing in to read.

A data base - pre-set of Terrain factors, doctrinal factors, weather, should be set up. As information comes in an analysis could refer to this data base, analyze, post and react to information being received.

Q. (4.)

Intelligence workbooks usually get reduced to spot reports files, with no one with time to work on the workbooks.

Q. (5.)

Once EOB map is posted, the workbook is not really workable, given time constraints on personnel.

Q. (6.)

WB posted when time available.

Q. (6.)

Only if step one yields no information at all.

Q. (6.)

Reduction to EOB posting on map is almost always possible.

2.1.2.4. MAINTAIN INTELLIGENCE WORKBOOK

Q. (7.)

Depends on whether or not information is raw data or already analyzed.

Q. (7.)

Time, not thought.

Q. (8.)

Report dependent

Q. (9.)

Report/situation dependent.

Q. (10.)

No.

Q. (11.)

Indicators come in one at a time, to reach a conclusion you need additional information.

Q. (11.)

Must be able to recognize patterns, and determine when data becomes obsolete.

Q. (12.)

An operator would need to be an intelligence analysis.

Q. (15.)

It may be too late, later.

Q. (15.) Comments:

You do not have time in the field to critique. The job is done or not done. The information being dealt with is on a near-real time basis and is thus very perishable.

2.1.2.4. MAINTAIN INTELLIGENCE WORKBOOK

Q. (18.) Comments:

Intelligence information is not cut and dry. It is dependent on weather, terrain and tactical-strategic situations. This is no one answer to any given set of questions.

Again the system needed by the intelligence community out in the field is one that is a data base - so that re-call and information assimilation can be done.

Q. (18.) Cont.

A system which is based on immediate input of time sensitive material would be useless.

Q. (18.)

Let analyst record his ideas so it will key him if other data comes.

2.1.2.5. MAINTAIN FRIENDLY SITUATION OVERLAY.

Q. (3.)

I think that this is a great idea - periodic display of the friendly situation on the OB map would be a tremendous asset however, all source to the G-3 and his office would create a cumbersome situation security wise. Data which is transmitted to the G 3 should not include compartmental intelligence.

(3.) Comments:

There will be a security problem with point 2 of this step. Intelligence information must be "sanitized" before posting to the G3 map, and the system must be secured so that people outside the EWIOC cannot gain information, via the computer, which contains compartmented information.

(4.)

When the G2/G3 maps are situated close enough so that both can be seen at once.

Q. (4.)

Focus on enemy forces is possible with friendly boundaries posted for addresses of warnings but more knowledge of friendly dispositions would make warnings timelier.

Q. (5.)

Data is old at division except: incorporation of plans into collection efforts to support future opinions.

(5.)

Since the friendly/enemy situation can change rapidly, and decisions are made based on G2/G3 maps, they must be current.

Q. (5.)

Boundaries can be sufficient at times, boundary changes being conditions where posting is non-deferable.

2.1.2.5. MAINTAIN FRIENDLY SITUATION OVERLAY

(6.)

Sometimes - Commanders are sometimes briefed from the knowledge in the heads of the G2/G3 when the situation changes too rapidly to post.

Q. (6.)

Boundary posting.

Q. (7.)

This is a manual operation largely dependant of knowledge of friendly tactics.

Q. (9.)

We can expect a Central European conflict to be extremely fast moving. Movements and locations of friendly forces must be known to all staff planners on a constant basis.

Q. (15.)

Basically for the same reasons as task 2123.

2.1.2.6. MAINTAIN TEMPLATING FILES

Q. (2.) Comments:

Need more specific actions to input/develop templates.

Q. (3.) Comments:

The operator is going to be too busy to read.

Q. (4.)

Not really - other than doctrinal template - others are more or less progressive.

Q. (4.)

For good analysis, one needs a base to work from IPB is that base.

Q. (4.)

In current type systems.

Q. (5.)

Provide cues to critical times and places on battlefield and location of possible critical codes.

Q. (5.)

Intelligence is very time sensitive.

Q. (6.)

Actual posting of templates is very time consuming - using event or decision theme - codes are usually briefed as to situation and postulated situation which would require action.

Q. (6.)

Use of doctrinal templates to make situational decisions/establish decision points/criteria in lieu of Decision support templates.

2.1.2.6 MAINTAIN TEMPLATING FILES

Q. (9.) Comments:

Every bit of information is important.

Q. (9.) Comments:

Many things are based on memory because it is usually too time consuming to be constantly flipping through doctrinal references or history to verify event or templates.

Q. (11.)

In building OB to correlate to doctrine.

Q. (13.)

The operators education level, i.e. reading ability, comprehension ability would need to be considered.

Q. (15.) Comments:

Instantaneous display of templates for correlation and comparison necessary.

Q. (15.)

I doubt seriously that the analyst will have the luxury of critiquing his own performance. I VAN will do it for him.

Q. (15.)

Time-factor is important. Given the amount of information, etc., could the operator get through all the tasks? Probably not. Templating should be in a preplanned data base file.

Q. (18.) Comments:

Templating is a pre-planned data base file. Re-call during a tactical situation in order that the analysis could compare items is important.

3.1.1.2. DETERMINE INDICATORS

Q. (3.) Comments:

Step 3 vital, most priority.

Q. (4.)

Poorly developed situation.

Q. (5.)

In fast changing current situations.

Q. 6.)

As in 5.

Q. (9.) Comments:

"As you sow, so shall you reap" deserving of detailed planning.

Q. (10.)

Not really.

Q. (11.)

Possibly can develop indicators by ongoing analysis of previous enemy actions to detect idiosyncrasies.

Q. (12.)

Hard to define profitable enemy idiosyncrasy.

3.1.1.2. DETERMINE INDICATORS

Q. (18.)

Might be able to use in writing future collections plans.

Comments:

(16) & (18) Best to display a matrix menu, allowing collection manager to task assets in fast breaking situation.

3.1.1.4. REVIEW THE COLLECTION PLANNING FILE

Q. (4.)

Step C - depends on situation.

Q. (6.)

Based on Procedure - intended recipient step may take priority with intermediary really short time later.

Q. (13.)

Depends on the Collection/Reporting system - whether or not messages automatically get re-transmitted or the lower echelons must constantly jog system for input (vice versa).

3.1.2.1. DETERMINE RESOURCE AVAILABILITY

Q. (3.)

1. A TOL would never be aware of the status (operational) of a particular system until after that system had failed to gather information - that step (#2) would not be of importance nor worth the time to keep track of for the division collection manager.

2. The only value I can see for part 3 would possibly be for briefing purposes. The collection manager is well aware of what assets are available and needs no reminder of that availability.

(3.) Comments:

3. 3114 & 3121 are reversed. Cannot do collection planning until resource availability is determined.

Q. (4.)

The point is to insure that one collection system is not overloaded or relied on too much. Need to consider all available before tasking.

Q. (5.)

Need to confirm information from one source in a timely manner.

(5.)

Available resources change constantly & this list must be current . (If a Mohawk has been shot down, it can't be tasked for intelligence).

Q. (5.)

If one resource fails and task must be given quickly to another.

3.1.2.1. DETERMINE RESOURCE AVAILABILITY

Q. (6.)

Some things can only be collected or confirmed by given source. Only certain assets are available in time/area required.

Q. (6.)

Immediate intelligence collection task may not allow time for listing.

Q. (7.)

Check operating status may take time, little thought.

Q. (9.) Comments:

The big point in this step is finding out what is available to do the job. Knowledge of system capabilities is extremely important and in and of itself shorten the step.

(9.) Comments:

Systems availability is usually kept on a chart, however, since situations change rapidly, this may not always be up-to-date.

Q. (11.)

Need current data of what equipment is destroyed, damaged, etc.

Q. (13.)

Depends on how the data base is kept up and personal knowledge of current situation.

Q. (13.)

Difficult to get all resources to inform DTOC of their current status.

3.1.2.1. DETERMINE RESOURCE AVAILABILITY

Q. (14.)

To prevent over loading and/or duplication beyond that required.

Q. (14.)

Should be able to note when equipment is already being used; damaged; etc. and delete when destroyed.

(18.) Comments:

If a systems availability flow chart could be automated, it could be corrected as the situation changes so as to be current.

3.1.2.2. DETERMINE RESOURCE CAPABILITY

Q. (3.) Comments

There are literally stores of parameters used to determine which source/system can best satisfy a particular EEI/OIR, etc. Some parameters are:

1. Time of day (lighting conditions)
2. Tanget weather (rain, fog, etc.)
3. System capabilities/limitations (i.e. given a particular air defense threat can an aerial platform satisfy your requirements)
4. Criticality of the information.
5. Etc., etc., etc.

Q. (4.)

When developing original collection plan. When you have a single high priority collection task, selection of source may be done without listing.

Q. (5.)

When such confirmation of other source or suspected information is needed.

Q. (6.)

Same situations as above, but only if step has been previously accomplished en detail.

Q. (6.)

If there is for instance particularly bad weather over the area of operations, then all aerial platforms may be hrounded thus eliminating the requirements to consider those in your selection process.

Q. (6.)

On the spot decisions by operations officer.

Q. (10)

Yes, hundreds.

Q. (11.)

Must have data on what is available and what each source is capable of.

3.1.2.2. DETERMINE RESOURCE CAPABILITY

Q. (12.)

In this step "available" means anything which can be used, regardless of whether it is currently engaged. Next step would be assigning resources, in which case available would mean free to be used at this particular time. "Available"in the letter sense would be more difficult to determine.

Q. (15.)

Data will be needed when resources must be assigned tasks. If possible amount of time each resource is tasked can be tabulated to later determine how successfully assets were managed.

Q. (17.)

If, for instance, you wanted to withdraw information (for briefing purposes) of the capabilities of a system a format like that might be O.K. For operational purposes of no use.

Q. (16. and 18.)

Note when resource is tasked, to do what, when completed, and results. What he did and the results could be cross referenced to another file, not detailed in the resource cap/avail listed. Again, amount of time, # of tasks could be noted.

3.1.2.3. IDENTIFY OTHER SOURCES

Q. (2.)

Too large a source/collection of information to be made compatible with IP.S.'s.

Q. (3.) Comments:

These task steps should be listed under resource availability.

Q. (6.)

During periods of intense activity the procedure to review and alleviate resources to gather information can be shortened by fast on the spot decisions.

Q. (11.)

If reliability factors indicates that assets are not functioning properly, more effort can be placed in other areas.

Q. (13.)

The only reference for an assets reliability to my knowledge has been the operator officer's memory.

MIQSTURE EXPERIMENTER'S GUIDE:

The following items within quotes should be explained to each participant. Although they may be paraphrased slightly to sound less formal, all of the information should be conveyed to each participant and in the order given here. Other, non-quoted items, are for the experimenter's benefit.

GREETING STEP: **Explain:**

a. **"You are one of a large group of participants. The exercise will take about an hour."**

b. **"This is not a test of your abilities; what we are testing is two different ways to enter questions into a computer terminal. Each of the participants enters questions using both methods of entry. Then we average the results for all participants, and compare the averages obtained from the two methods."**

c. **"First you will read and practice, and then do the parts of the experiment."**

d. **"Don't worry about 'mistakes', this is part of what we are testing about the methods of entry. We won't ask you to do the test tasks until your practice performance looks OK to us."**

ORIENTATION STEP:

a. **"This is the computer terminal."**

b. **"It communicates to you through the screen."**

c. **"You communicate to it through the keys."**

d. **Demonstrate the cursor to the participant, calling it by name.**

e. **In a setting without distractions, give participant the "PARTICIPANT ORIENTATION BOOKLET". Indicate that the booklet should be read thoroughly, and the four practice items at the end filled in.**

f. **When participant is finished with booklet, answer all questions and make a note of all pertinent questions.**

g. **Correct and discuss the two practice runs with participant.**

h. **Move to the terminal:**

- **Log-on using Bell's ID: [User: osi046[CR], password: bell[CR], % cd tests[CR]].**
- **Empty the transactions file: [% rm transactions[CR]]**
- **Bring up MIQSTURE: [% miq[CR], bkfn[EXECUTE]]**

PRACTICE STEP:

a. **Seat participant at terminal.**

b. **Show participant the [AND], [EXECUTE], and [BACKSPACE] buttons, discuss if necessary.**

c. Ask participant to enter the first practice query (Adams,C) in the fill-in form. Help with each step if needed (i.e.,qu [EXECUTE] to get fill-in form).

d. Make sure the participant uses proper upper and lower case characters, and also that there is no space between the comma and the first initial. Explain that the data search values must be entered exactly as shown on the request slips. (This is not discussed in the booklet which the participant has just read, we will get better results if it is fully explained now).

e. Have participant enter second practice query in fill-in form. Give help if needed.

f. Ask participant to enter both practice queries again, but in free-style form. Again, coach: (i.e., qu is followed by one or more blanks and then the free-style key-in of the query). Also, note that the "and" *must* have a space before and after it when typed in free-style.

g. Explain that the participant will be given slips of paper with questions on each one which will be submitted to the computer. Each slip of paper has the query in plain English, and a space for the answer.

CONTROL PERFORMANCE STEP:

a. Give the participant Question slip #1, simultaneously hitting "READ" on the terminal.

b. Make sure that the participant is entering the query in the fill-in form.

c. Repeat for slips 2 thru 5.

VARIABLE TREATMENTS PERFORMANCE STEP:

a. Participants are assigned to treatments 1, 2, or 3 in the sequence in which they appear for the experiment (i.e., 1,2,3,1,2,3,etc.). The MIQSTURE simulation system is set by the experimenter to one of the three treatment conditions for the variables treatments performance step as follows:

   — Treatment 1: no change from previous steps.

   — Treatment 2: bkfe [EXECUTE] (history window filled element at a time).

   — Treatment 3: bkfl [EXECUTE] (history window filled line at a time).

b. Tell the participant that another 5 questions will now be given, and that each one should be read and the query entered in the fill-in format. For treatments two and three, make the following additional explanations:

   — Treatment 2: "I have turned on the transactions window and the transactions history windows (point). As you type the query into the fill-in form, it will now be automatically translated into the free-style key-in form and will appear in the transactions window, a term at a

time. When you [EXECUTE] the query, the free-style key-in form of the full query will also appear in the history window. In this way you can compare the fill-in and the free-style forms for entering a query. This is helpful as a reminder, because later you are going to enter queries by using the free-style form."

- Treatment 3: "I have turned on the query history window (point). As you type the query into the fill-in form, it will be automatically translated into the free-style key-in form. When you [EXECUTE] the query, the free-style key-in form of the full query will also appear in the history window. In this way you can compare the fill-in and the free-style forms for entering a query. This is helpful as a reminder, because later you are going to enter queries by using the free-style form."

c. Give participant slip 6 and simultaneously hit READ, making sure participant is entering the query in the fill-in form.

d. When participant has EXECUTED and written down answer on slip, say: "Notice the free-style key-in form of the query you just entered as it is shown in the history window."

CRITERION PERFORMANCE STEP:

a. Turn off history display: [bkfn[EXECUTE]]

b. Instruct the participant:

- "Now I'd like you to enter some queries by using the free-style key-in format in the same manner you did earlier during the original practice session."

c. Cycle slips 11 thru 15 in the same manner as described for previous steps.

d. Make sure that the participant is entering the queries in free-style form.

e. After finishing the fifteenth query, exit MIQSTURE (ex - [EXECUTE]). Collect the 15 query request slips and staple, write participant's name on first slip. Also write participant's phone number or mail address on the first slip if the participant wishes to hear later about the results of the experiment. Place slips in MIQ PARTICIPANT RESULTS folder. Thank and dismiss participant.

MAINTENANCE CYCLE:

a. Print the transactions file [% print transactions [CR]], write participant's name on the transactions printout, and place in MIQ PARTICIPANT RESULTS folder.

b. After assuring that the transaction file printout is complete, enter two commands:

1. [% cat transactions >> archive[CR]]
2. [% rm transactions[CR]]

PARTICIPANT ORIENTATION BOOKLET

The exercise you are about to help us with is an experiment on ways to use a computer terminal to ask questions of a file of data stored in the computer. Two ways of submitting questions to the computer system are being compared. In the experiment, you will convert written questions given to you into queries that the machine understands and submit them to the computer through the terminal. The computer will respond with the number of records it finds that correspond to each query.

Here's an example. Suppose that a computer file of information about employees working for a company is maintained for various uses within the company. Here is what the information on one person in the file might look like:

name (name) Jones, B_____	address (addr) 12345 Main___	city (city) Encino____	state (stat) Ca	zip (zipc) 91234	dept (dept) 099	years (yotj) 4_
12-AN	15-AN	10-A	2-A	5-N	3-N	2-N

This is one record about one person. The individual divisions of information (separated by vertical lines) in each employee's record are called the *data elements*. Note that the following items are shown for each data element; from top to bottom:

a. the full data element name (name, address, city, etc.)

b. name abbreviation (the four characters in parentheses)

c. space for the element value (using underscores)

d. allowable format (12-AN means twelve alphabetic or numeric characters at most may be typed in; 10-A, ten alphabetic characters only; 3-N, three numeric only)

The information in a data element is called the data element value. For example, Jones, B is a possible value for the (name) data element, Encino is a value for the (city) data element.

Remember:

1. A data *record* is a group of data elements about *one* particular thing.

2. A data *element* is a single type of information in a data record.

In this exercise, you will be querying (searching) a file of personnel records like the example. There are two ways to query the file of records in the experimental system you will be using: 1. free key-in style and 2. fill-in the form.

Here is how a user would enter a query using the free key-in style. Suppose you wish to find the number of records in the file for people who both: 1. live in Encino, *and* 2. have 4 years on the job. You would:

1. type in the following string of characters and spaces:

   qu (city)Encino and (yotj)4

2. push the button marked EXECUTE.

- The "qu" tells the computer system that a query follows on that line.
- "(city)Encino" tells the computer to count the number of records in the file for employees who live in Encino. (Notice that there is no space between the element abbreviation and the data value following it.)
- "(yotj)4" tells the computer to count the records for employees with four years on the job.
- Finally, the "and" which links the request of the two different elements (city, years on the job) tells the computer "count ONLY THOSE records in which '(city)' is Encino and '(years on the job)' is four."
- (The message returned by the computer is: "2 HITS" for the experimental data file.)

The other way to enter a query is through the fill-in form. The fill-in form looks just like the sample record shown earlier in the booklet, but without data values in the element boxes. The figure below provides an example of the fill-in form display. The fill-in form is requested from the machine by typing "qu" and pushing the EXECUTE. In response to the "qu EXECUTE" command the fill-in form appears, and the cursor moves to the first data position of the first element. (The *cursor* is a small bright rectangle on the screen that shows where the next letter or space will appear when typed by you. The cursor can be moved by the alphabetic and numeric keys, the space bar, and backspace in the free key-in style and may also be moved by the special "and" and "or" keys in the fill-in the form style.)

In the example, the query is the same one used earlier, (that is, employees living in Encino with four years on the job, without regard for what might be in the other elements like name or address).

name (name)	address (addr)	city (city) Encino	state (stat)	zip (zipc)	dept (dept)	years (yotj) 4
12-AN	15-AN	10-A	2-A	5-N	3-N	2-N

In this form, the user should fill-in only those boxes needed for query. The AND key is depressed to move the cursor to the right from one element box to the next. If the records for all of the people who live in Encino are needed, move the cursor to the element box labeled "city" and type in Encino. Additionally, if only the persons from Encino with four years on the job are desired to be included in the count, the user should push the "and" button the number of times it takes to move the cursor forward to the first space in the "years" element box and type in "4". Then to start the operation of searching by the computer, the user must give the query to the computer by depressing the EXECUTE button.

Again, the message returned by the computer is "2 HITS".

You will be asked to do both types of query entry. That is, you will be entering some queries via *free-style key-in* and others through a *fill-in-the-blank form.*

The sequence:

- The interviewer will make sure the computer terminal is ready to be used.
- As you are given each question on a piece of paper, immediately depress the button marked "READ".
- Study the question, and when you feel you know how to enter a query, proceed. If you type a character that you didn't mean to type, the "backspace" key is used to go back to the point from which you want to continue. After you have entered the query to your satisfaction, push **EXECUTE**.
- Record the number of "HITS" and return the piece of paper.

Now for some practice. Please compose the four queries asked for below. (When you have finished all four, you may look on the last page for the correct answers). Using the *fill-in form*, find out if there are any employees in the file with the name of "Adams,C".

name (name)	address (addr)	city (city)	state (stat)	zip (zipc)	dept (dept)	years (yotj)
12-AN	15-AN	10-A	2-A	5-N	3-N	2-N

Compose a query in a *fill-in form*, to find the number of employees in department 097 with 4 years on the job.

name (name)	address (addr)	city (city)	state (stat)	zip (zipc)	dept (dept)	years (yotj)
12-AN	15-AN	10-A	2-A	5-N	3-N	2-N

Enter the two preceeding questions in *free-style key-in* form. Print the query as you think it should be typed in the following box.

The number of employees in the file named "Adams,C",

The number of employees in department 097 with 4 years on the job,

Using the *fill-in form*, find out if there are any employees in the file with the name of "Adams,C".

name (name) Adams, C_____	address (addr) _____	city (city) _____	state (stat) __	zip (zipc) _____	dept (dept) ___	years (yotj) __
12-AN	15-AN	10-A	2-A	5-N	3-N	2-N

EXECUTE

Compose a query in a *fill-in form*, to find the number of employees in department 097 with 4 years on the job.

name (name) _____	address (addr) _____	city (city) _____	state (stat) __	zip (zipc) _____	dept (dept) 097	years (yotj) 4_
12-AN	15-AN	10-A	2-A	5-N	3-N	2-N

EXECUTE

Enter the two preceeding questions in *free-style key-in* form. Print the query as you think it should be typed in the following box.

The number of employees in the file named "Adams,C",

qu (name)Adams,C EXECUTE

The number of employees in department 097 with 4 years on the job,

qu (dept)097 and (yotj)4 EXECUTE

G-Test Questions Set

1. Enter a query in the *fill-in form* for the following:

   The number of persons recorded in the file who live in Oxnard is_____.

2. Enter a query in the *fill-in form* for the following:

   How many persons named "Ames,P" are in the file? Answer___

3. Enter a query in the *fill-in form* for the following:

   How many residents of Zip code 91222 have 10 years on the job? Answer___

4. Enter a query in the *fill-in form* for the following:

   Does anyone in department 098 live in Burbank? Circle one: yes no

5. Enter a query in the *fill-in form* for the following:

   How many California (Ca) residents with 3 years experience are in the file? Answer___

6. Enter a query in the *fill-in form* for the following:

   Does the city of Smog View have a Zip code of 91334? Circle one: yes no

7. Enter a query in the *fill-in form* for the following:

   How many residents of the city of Simi are in department 098? Answer___

8. Enter a query in the *fill-in form* for the following:

   Count the number of employees living in Topanga and on the job 10 years. Answer___

9. Enter a query in the *fill-in form* for the following:

   Does anyone by the name of "Bush,L" live at 31 Thornyrose? Circle one: yes no

10. Enter a query in the *fill-in form* for the following:

    How many residents of Zip code 91364 have 3 years experience? Answer___

11. Enter a query in the *free-style form* for the following:

    How many Arizona residents (Az) of department 091 are there? Answer___

12. Enter a query in the *free-style form* for the following:

    Does a person by the name of "Marr,A" work in department 096? Answer___

13. Enter a query in the *free-style form* for the following:

    Does Burbank have a Zip code of 91235? Circle one: yes no

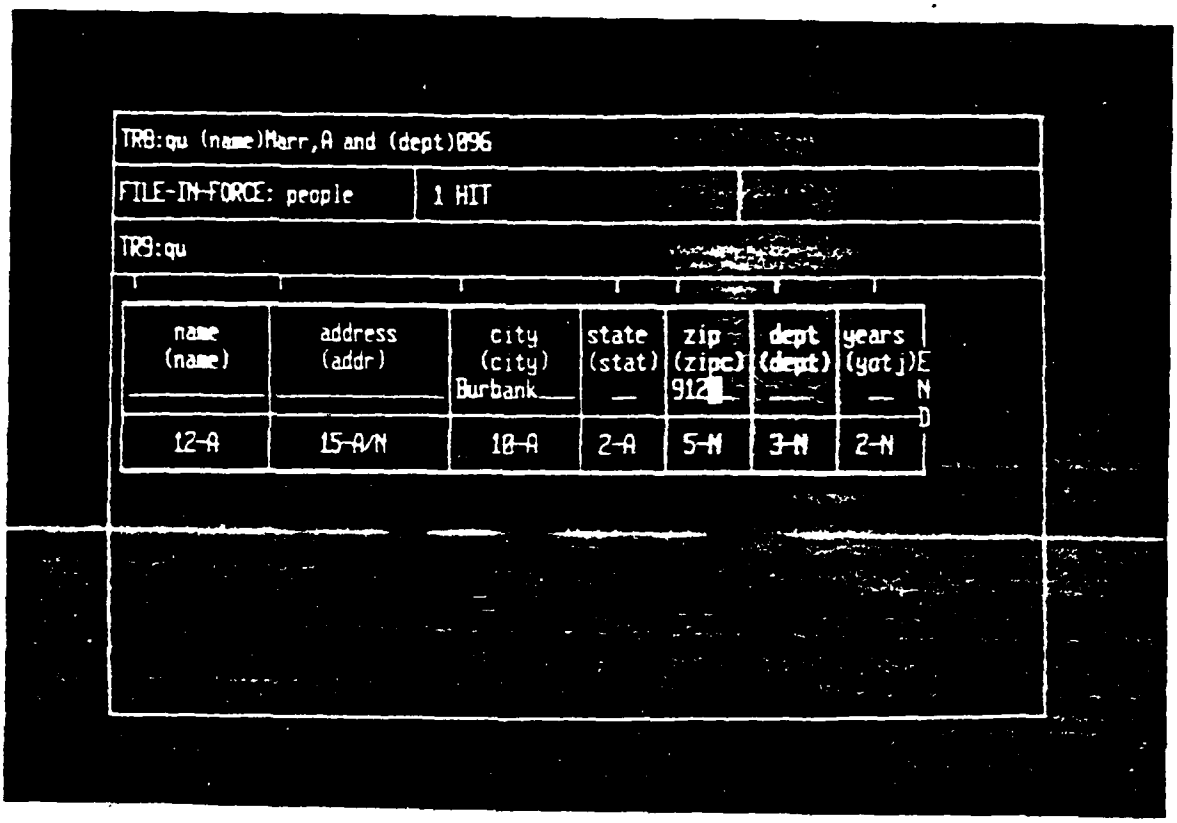
14. Enter a query in the *free-style form* for the following:

    Is there anyone with 4 years on the job from Burbank? Circle one: yes no

15. Enter a query in the *free-style form* for the following:

    How many persons named "Bird,R", live in the city of Woodland and have 9 years on the job? Answer___

H-MIQSTURE Screen Image



The accompanying photograph of the MIQSTURE screen shows the various windows in the display:

1. The top window, starting TR8:qu, is the transaction history window. In the photograph it contains a record of the previous query.
2. The next line contains three status windows. The file status window indicates that the file-in-force is the "people" file. The transaction status window in the middle indicates that there is a one record "hit" for the previous query displayed in the transaction history window.
3. The third line contains the current transaction window, and indicates that the current transaction (No 9) is to be a query.
4. The fourth window is the "data" window, and contains in this instance the fill-in format for the record type in the "people" file. Note that the user is in the process of entering the query for the question item "Does Burbank have a Zip code of 91235?" (the "35" has not been entered yet).